How Music REALLY Works!

ALSO BY WAYNE CHASE

Roedy Black's Complete Guitar Chord Poster

Roedy Black's Complete Keyboard Chord Poster

Roedy Black's Guitar & Keyboard Scales Poster

Roedy Black's Musical Instruments Poster

Roedy Black's Chord Progression Chart

The Gold Standard Song List

How Music REALLY Works!

The Essential Handbook

for Songwriters, Performers, and Music Students

SECOND EDITION

Wayne Chase

Roedy Black

Roedy Black Publishing Inc.
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How Music REALLY Works! is a serious critical study of popular songwriting technique as exemplified by various songwriters. Brief quotations of lyrics are intended to illustrate or explicate the critical argument and information presented by the author of *How Music REALLY Works!* and thus constitute fair use under existing copyright conventions.

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www.GoldStandardSongList.com
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TO ANNA

CONTENTS

PART I
THE BIG PICTURE

Part II
Essential Building Blocks of Music

Part III
How to Create Emotionally Powerful Music and Lyrics

9 How Melody and Melody-harmony Integration REALLY Work 567

10 How Lyrics REALLY Work 641

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Advisory/Disclaimer

This book provides information primarily on the art and craft of songwriting, and secondarily on marketing and promoting popular music. It is sold with the understanding that the publisher and author are not engaged in rendering legal or other professional services. If you require legal and other expert assistance, you should seek the services of a competent professional.

Since this book is but one of many on the subject, you are urged to survey as much material as you can about writing and marketing your songs, recordings, and live act, and tailor the information to your individual needs. Appendix 2 lists some resources you may find useful.

Every effort has been made to make this book as accurate as possible. However, there *may be mistakes*, both typographical and in content. Therefore, this text should be used only as a general guide and not as the ultimate source of songwriting and marketing information. Furthermore, this book contains information that is current only up to the printing date.

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PART I

THE BIG PICTURE

Introduction

Yes, You *Can* Create Compelling, Emotionally Powerful Music and Lyrics… *If* You Know What You're Doing

Making music should not be left to the professionals.
—MICHELLE SHOCKED

INTRO.1
MUSIC NOTATION? NOT HERE!

Most musicians play by ear. Suppose *you* play by ear. What use would you have for a book on musical technique full of examples in the form of *music notation*? Doesn't make sense. Other ways of explaining music work just as effectively. Or even better.

Fluency in music, like fluency in language, does not require the ability to read or write. So, *How Music REALLY Works!* has *no music notation*.

FIGURE 1 ***How Music REALLY Works!*****—A Music-Notation-Free Zone**

In case somebody has ever advised you that learning how to read and write music notation will make you a better songwriter or performer, here are just a few of the many songwriters who did alright without notation skills:

Irving Berlin	John Lennon
Johnny Cash	Paul McCartney
Errol Garner	Muddy Waters
Jimi Hendrix	Brian Wilson
Robert Johnson	Stevie Wonder

And some non-songwriters ... performers who managed to play and sing their way to glory without knowing how to read or write music:

Louis Armstrong	Luciano Pavarotti
Bix Beiderbeck	Elvis Presley
Dave Brubeck	Django Reinhardt
Glen Campbell	Buddy Rich
Bing Crosby	Frank Sinatra
Judy Garland	Ella Fitzgerald
Kate Smith	Chet Baker

Musical skill is *normal* in the human species. Not a rare talent. Most people have the potential to sing and to play an instrument with reasonable competence, even if they've never tried. Even if they've tried and failed (usually due to inept instruction). Ability to read or write music notation has nothing to do with it.

Same with songwriting. Contrary to common belief, it's not a special gift. Anybody can write a song. Even a five-year-old child.

But hardly anybody has one vital skill required to create brilliant, classic songs.

INTRO.2
AN ESSENTIAL SKILL SONGWRITERS AND PERFORMERS LACK

The main part of this book focuses on techniques you can use to create *accessible, memorable, emotionally powerful* music and lyrics. The biological connection between music and emotion in the human species goes back hundreds of thousands of years, as you'll see in Chapters 1 and 9. Music evolved as an *emotional communication* system. And 99.9% of songwriters have no idea how it works or *how to exploit it*. It's the essential skill they most need, and most lack. That's why, for example, the companion to this book, the *Gold Standard Song List* (GoldStandardSongList.com) has only 5,000 songs on it (from a full *100 years* of songwriting), instead of 5,000,000 or 500,000,000 songs.

You have but one instrument at your disposal that you can use to create emotionally powerful music: the 100,000-year-old neural organ inside your skull. If you don't understand how it works musically, you have *no advantage* over a million other aspiring songwriters and performers. If you don't know how to manipulate certain elements of music and lyrics to evoke emotion, you will fail in the marketplace as a songwriter and as a performer of your original songs. Potential audiences do not want to hear emotionally anaemic songs, no matter how well performed.

Technology will not save you. All the digital hardware and software in the world can't come remotely close to emulating what your brain can do when it comes to creating emotionally evocative music and lyrics.

In short, if you want to break away from the masses of struggling musicians, you have to learn how to use your brain's evolved musical and linguistic modules to create accessible, memorable, emotionally powerful music and lyrics.

INTRO.3
TECHNIQUE FIRST, *THEN* EMOTIONAL ABANDON

First, you need to learn the technical elements covered in this book. Learn the skills Lennon and McCartney spent years acquiring before they ever wrote a song. They didn't read music, but by the time they started recording original songs, they had absorbed an awful lot of technical stuff about music.

Their technical knowledge did not come to them magically. Growing up in Liverpool in the 1940s and early 1950s, Lennon and McCartney absorbed a good deal of their musical know-how from the classic songs of great masters such as the Gershwin brothers, Noel Coward, Cole Porter, and Irving Berlin. McCartney learned

much about how music works from his father, a proficient amateur pianist who also played trumpet in a jazz band.

Additionally, the lads devoured the best of American country, folk, and blues, thanks to young Liverpool sailors who brought home the latest records. Lennon and McCartney met in 1957, a couple of years after rock 'n' roll (as it was known then) had become an international phenomenon. An early poster of Lennon's pre-Beatles band, The Quarry Men, advertises the band's repertoire in this order:

Country • Western • Rock 'n' Roll • Skiffle

In the years before getting signed to a label, The Beatles played hundreds of gigs in England and Germany—covers of now classic songs. Once signed, they recorded covers of early rock 'n' roll tunes such as "Long Tall Sally," "Roll Over Beethoven," and "Matchbox." They also covered some decidedly non-rock material such as "A Taste of Honey" and Meredith Willson's 1957 Broadway show tune, "Till There Was You," from *The Music Man.* Learning all those covers—everything from wartime dance hall tunes to American rockabilly and blues—and playing them over and over and over instilled in Lennon and McCartney a deep understanding and feel for the way great songwriters meld technical and psychological elements to create memorable songs. Any intelligent songwriter who learns how to do this (one way or another, not necessarily the way Lennon and McCartney mastered it), and applies it in his or her own original creative style, can compose brilliant songs *consistently*. Songwriters who do not learn how to do this (the vast majority) turn out mediocre material.

As you go through this book, don't focus on rote-memorization of details. Just take in the major concepts (more on this in a minute). After a while, the most important techniques, summarized at the ends of Chapters 6 through 11, will become second nature to you. Habitual.

Once you've mastered the technical stuff, *then* write with unpremeditated emotional abandon. Without thinking about whether your methods are "technically correct." It's like learning and applying any skill. Riding a bike or a horse. First you nail the technique, then you take off and explore. (Even when you've become highly skilled, you'll find yourself editing and revising initial drafts to make each musical and lyrical component as powerful and memorable as possible.)

WHY THIS BOOK IS A CLASSIC WESTERN (AND WHY YOU WILL NEED A HORSE)

In Chapter 2, you'll learn why music does not "progress" the way science and technology progress. Instead, artists, including songwriters and performers, aim to create *classics*. (Artists who don't aspire to create classics are hacks.)

The popular songs of English-speaking nations of the West serve as this book's reference base for examples and illustrations. Especially the 5,000 classic songs of Western popular music you'll find at www.GoldStandardSongList.com. Classic songs by Western songwriters such as Bob Dylan, 2Pac, The Beatles, Hank Williams, Joni Mitchell, Marvin Gaye, Ferron, the Gershwin brothers, James Brown, Wu-Tang Clan, David Bowie, Annie Lennox, Bob Marley, Duke Ellington, the McGarrigle sisters, Tom Waits, and a thousand others.

How Music REALLY Works!, then, is a **Classic Western.**

That means, to get the most from this book, you will need a horse. If you don't already have one, Sadie and Ellie Sue over at the Dodge City Horse Store can probably fix you up. If they don't have one to your liking, two stagecoaches leave Dodge every morning, one eastbound to Wichita and the other southbound to Amarillo. Good horse stores in both towns.

If you need a drink (and you probably will because you'll find some bits of this book as dull as a lecture on the geology of gravel), ride on over to the Wrong Ranch Saloon. Ms Puma owns the place and pours the Jack Daniel's. She has a heart of gold because, in accordance with her life's role as a cliche in a Classic Western, she used to be a prostitute but has changed her ways.

These days, as she tends bar at the Wrong Ranch, Ms Puma has a lot of interesting things to say on all kinds of topics, such as intelligent design and particle physics. For instance, she can explain to you in plain English why it is that, as quarks and gluons get closer together, the forces between them get weaker and weaker. Which, as folks in these parts realize, simply defies common sense.

If you have a problem with horse stealers or other nasties, get hold of Marshal McDillon. You'll most likely find him over at the Wrong Ranch Saloon, visiting with Ms Puma a lot. If you can't find the Marshal, look for Deputy Fester, who hangs around Sadie and Ellie Sue's horse store. Which is ironic, considering Deputy Fester can't ride a horse to save his pathetic soul.

If you have a medical problem, Doc Yada-Yadams might be able to treat you. If he's sober. Which is seldom. But without him, this Classic Western would lack another important cliche, the town drunk.

INTRO.4
WHAT YOU NEED TO KNOW TO UNDERSTAND EVERYTHING IN THIS BOOK

In short, not much. Here's a list:

- How to count to 32 (well, maybe all the way up to 64).
- How to locate and play the notes A, B, C, D, E, F, and G on a piano or guitar or other instrument.
- Roman numerals from "I" up to "VII".
- The meaning of simple ratios, such as "2:1", as in "At the Wrong Ranch Saloon, Moosehead beer outsells Diet Coke 2:1".
- How to find, explore, and exploit the *Gold Standard Song List* (hint: it's at www.GoldStandardSongList.com).
- What songs to play on your mouth organ for your horse as you ride along in the Deep Purple of Twilight Time through the Blue Shadows on the Trail.

The farther you travel, the more you will need to get acquainted with the *Gold Standard Song List* and the instructions at that website on how to listen to free, legal excerpts of songs, and how to get the lyrics for any of the songs.

INTRO.5
THE TERRITORY AHEAD

All songs spring from songwriters' information-processing brains. Great songwriters reveal in their songs (both music and lyrics) an intuitive understanding of the evolutionary biology of music. That's the subject of Chapter 1.

Songs become timeless classics if they tap into shared human universals, aspects of evolved behaviour that have not changed in tens or hundreds of thousands of years. As you go through this book, you'll learn how to apply insights about how your brain works in the process of creating and performing your songs. And how your listeners' brains work when they hear your songs.

Is it tough to learn?

In a word, nah. It ain't rocket science.

Here's the thing. You can't separate biology from the arts. That includes music. The human brain's built-in receptors for patterns and sequences become activated at several levels when the brain senses patterns in melodies and chords and rhythm and lyrics. *How Music REALLY Works!* shows you how to exploit your brain's adaptation for music in your songwriting and performing technique.

You'll probably write much better songs, *memorable, powerful* songs, once you gain an understanding of how the brain processes music and lyrics, and the emotional connections it makes. (You'll perform better, too).

That does not mean you have to memorize all the technical details in this book. Instead, you only need to understand the essence of what you're reading. You can go through the material at whatever pace you're comfortable with. No need to rush. Your brain will retain the *gist* of the material that interests you, the stuff you find yourself having fun with—especially the territory that's new for you. When you're done, of course you'll need to look up specific details from time to time to refresh your memory. But you don't need to memorize lengthy passages to acquire useful information.

The oft-quoted philosopher, Huckleberry Finn, best sums up where you're headed in the following pages, and why:

> I reckon I got to light out for the Territory ahead of the rest because Aunt Sally she's going to adopt me and sivilize me, and I can't stand it. I been there before.

"DON"T TAKE YOUR GUNS TO TOWN"

Before you get going, here's some friendly advice from Deputy Fester: don't take your guns to town.

He's referring to an incident that happened at the Wrong Ranch Saloon on the main street of Dodge some years ago. Deputy Fester told the whole story to an admiring reporter from the *Dodge City Musical Saw Weekly* in an interview at the Wrong Ranch.

"See that dusty cowpoke on the barstool yonder? Watch what you say around him. He'll try to laugh you down. He's the dude Billy Joe's ma warned Billy Joe about in the Johnny Cash song, 'Don't Take Your Guns To Town.'

"She warned Billy Joe quite a few times in the chorus. 'Leave your guns at home, Bill,' she said. 'Don't take your guns to town.'

"But did he listen to his ma? Noooooo.

"Here's the story. Billy Joe straps on his guns and tells his ma he's a *man*, and gets on his horse and he rides into Dodge.

"He hitches his horse outside the Wrong Ranch and strides in like he owns the place and orders a double Jack Daniel's and Ms Puma serves it up. Which Billy Joe knocks back too fast, and starts coughing like an idiot.

"So the dusty cowpoke over there starts laughing him down. Next thing you know, they get into that famous gunfight, and the cowpoke plugs Billy Joe real good, because that's how the song goes.

"We planted Billy Joe up on Boot Hill. That part isn't in the song, but we had to do *something*. You can't just leave a body shot full of holes to rot on a saloon floor. It would stink like a sack of rotten eggs in a day or two. Ms Puma would lose her license pretty quick.

"We couldn't even report the shootout to Marshal McDillon, because that's not in the song either, and Johnny Cash wouldn't let us change the lyrics. He told us he already shot a man in Reno just to watch him die, in one of his songs, and he didn't take kindly to strangers messing with his plot lines. Especially in a song where a dude gets shot. Bad karma, Johnny Cash said. So the dusty cowpoke never even got arrested.

"So that's why I advise everybody who reads this book to please leave your guns at home. You never know what sort of dangerous characters and ideas you might come across, itching to pick a fight. Thank you."

1

What Music REALLY Is, Who Makes It, Where, When, Why

Information is not knowledge. Knowledge is not wisdom. Wisdom is not truth. Truth is not beauty. Beauty is not love. Love is not music. Music is the best.

—FRANK ZAPPA

1.0.1
PIQUING THE POLARIZED

Chapter 1 addresses these five basic questions about music:

1. WHAT is music?
2. WHO makes music?
3. WHERE does music come from?
4. WHEN did music get started?
5. WHY is there such a thing as music?

The other question, "HOW does one go about creating music worth listening to?" takes nine chapters to answer—Chapters 3 through 11, the main part of the book.

Tackling the five "Ws" of the phenomenon of music necessitates delving into Darwinian natural selection and sexual selection. If you have a strong religious faith,

you may find bits of Chapter 1 offensive because of all the evolution stuff. On the other hand, if you have a strong atheistic belief, Chapter 1 may offend you, too, because it does not advocate for atheism.

If you already know all about natural selection and sexual selection and brain modularity, then Chapter 1 might simply bore you. If so, why not grab a bag of chips and ride on ahead to Chapter 2, which discusses the rise of the Western popular music industry and its various genres. Or Chapters 3 through 11, the sections on how to create memorable, emotionally powerful music and lyrics.

1.1 What Is Music?

1.1.1 BIOLOGICAL, NOT MYSTICAL

Music has played a central role in human existence for hundreds of thousands of years.

So...what *is* music?

According to the evidence, it's probably an *adaptation*—although some researchers argue music is a byproduct of other adaptations.

What's an adaptation?

It's a biological trait that evolved to promote survival or reproductive success. A tiger's fangs. A peacock's fan. A mosquito's ability to draw blood and escape into the night, just as you're trying to get to sleep.

As a human, you possess many formidable adaptations, such as bipedalism (two-legged walking), language, and a lot of other inborn skills that your fellow primates do not have. (Unlike horses, all *primates*— several hundred species—have highly flexible 5-fingered hands, opposable digits, and sharp eyesight. Some, such as monkeys, apes, and humans, also have relatively large brains.)

Before biologists confer "adaptation" status upon a human trait, in a solemn ceremony at Stonehenge under a full moon, said trait must fulfil several criteria, among them:

- Humans in all present-day cultures must use the adaptation.

- Evidence from history and anthropology must indicate the adaptation's existence in ancient cultures.

- Evidence from palaeontology must indicate the adaptation's existence to some degree in extinct *hominid* species—that is, in other species of bipedal human-like primates, all now extinct.

All of the above apply to language and bipedalism. They also apply to music. Every human culture ever known has had music. Even societies that do not have well-developed visual arts show sophisticated musical development.

Today, practically all normal adult human beings:

- Can and do sing to some degree (*Pop Idol/American Idol* contestants notwithstanding), even if only in the privacy of an elevator or on the back of a horse in the hills south of Tulsa.

- Can and do tap at least one foot to a tune, once in a while (an important qualification as you'll see in a minute).

- Listen to self-chosen music, purchase music, and otherwise show appreciation for music at some level. ("I could've played guitar like Jimi, but I chose to go into accounting instead, to meet more women.")

1.2 Who Makes Music?

1.2.1 Hootin' and Howlin': How Animal Sounds Differ From Other Sounds In Nature

In nature, when you listen to the wind in the trees or water rushing in a stream, what do you hear? Random and diffuse background sound. Like traffic in the city. A wide range of frequencies all mixed together. (*Frequency* just means number of vibrations per second. A given frequency number corresponds to a particular tone or note, such as A-440, the A above Middle C. More on this in Chapter 3.)

Animals evolved ways of signalling each other using calls that focus on *narrow* bands of frequencies. Energy concentrated in this way results in sounds that carry long distances. You can hear the hootin' and howlin' easily against the random background sound.

Species also evolve sounds specific to their own kind, so that they can identify each other. In a tropical rainforest, for example, a small area of, say, one square kilometre may contain scores of different bird species. Each species has evolved a *signature sound*, a distinctive song or repertoire of songs. (More on developing a signature sound in Chapter 11.)

1.2.2 HOOTIN' AND HOWLIN': INSTINCTIVE VS LEARNED

Studying vocalizations of non-human animals provides some clues about how music originated in humans. For instance, some animals use vocalizations to signal alarm, some to signal discovery of a food source.

All birds with complex songs learn their songs from each other. But they don't learn just any old tunes—they learn species-specific songs only. And, once learned, their songs change little. The fact that they learn songs at all, though, makes birds musically akin to humans, whales, and dolphins. (But that does not mean humans became musical by imitating birds!)

Oddly, some of our closest primate relatives, monkeys and chimpanzees, *do not* learn their vocalizations from each other. They're born with an instinctive and limited repertoire of grunts and calls. Chimpanzees have about 30 calls. Even the charming vocal duetting of gibbons is not learned; it's innate.

Animal calls and songs normally communicate an emotional state. So it's possible that the musical vocalizations that humans evolved did not co-evolve with language, since language communicates mostly information. Human music may have predated human language, but it's highly unlikely that language evolved before music.

1.2.3 HUMAN SOUNDMAKING: DISCRETE PITCHES (NO MORE HOOTIN' AND HOWLIN')

Non-human primate vocalization takes the form of unpitched grunts and calls, rather than discrete pitches. Your human brain does not respond happily to continuously

sliding hootin' and howlin' when presented in musical or speech contexts. It gets confused.

Unlike all other animals, humans evolved a vocal communication system that uses mainly *discrete pitches*. You can hear it in both speech and music. That's why the melodies of songs found in all musical traditions follow *scales*, groups of discrete pitches (the subject of Chapter 4).

1.2.4 HUMAN SOUNDMAKING: ENTRAINMENT (THAT'S *EN-TRAIN-MENT*, NOT ENTERTAINMENT)

Humans *entrain* to isometric beats.

- To *entrain* (from the same root as "train," referring to being dragged or carried along) means to join in and synchronize to a rhythmic source *outside the body*—to play, clap, tap, sing along. Or, as a musician would put it, to lock in with the band.

- *Isometric* refers to steady, evenly-spaced regular beats.

The ability to entrain rhythmically to an *external* beat—vital in both music and dance—has evolved only in humans. No other animal can do it. Selective pressure for teamwork and group coordination may have triggered the evolution of the rhythmic entrainment function in humans.

(Selective pressure refers to the environmental demands—including conditions in the social environment—that favour the Darwinian evolution of physical and mental traits over a long period of time. In short, selective pressure *drives* Darwinian evolution. For example, selective pressure for group bonding may have driven, among many other social behaviours, the evolution of the human ability to *harmonize*, or blend discrete pitches—a skill unique to humans.)

The innate ability to entrain means people can participate in a musical performance without knowing how to play a musical instrument—clapping along, nodding to the beat, and, of course, dancing. A few animals can chorus in synchrony, such as frogs and crickets. But only humans can vary the tempo (number of beats per minute) from slow to several times faster, without losing the sense of synchronous timing.

Only humans have the ability to play musical instruments. Non-human primates cannot keep a steady beat or learn new melodic sequencing. That's why they're incapable of playing the most basic of instruments, and cannot be trained to learn even the simplest human music (although they can learn simple human language).

Every human culture ever known has had music. We humans take for granted our effortless discrete-pitch vocalizing and isometric time-keeping skills. Non-human animals have no such abilities, and consequently no true appreciation of bluegrass, ABBA, or hip-hop. Except for certain breeds of dogs who join in when they hear particular songs from musical theatre and R & B.

1.3
Where Does Music Come From?

1.3.1
NOT OUT OF THIN AIR: MUSIC COMES FROM EVOLVED BRAIN "MODULES"

Some people believe music comes wafting magically out of thin air in the form of mysterious, disembodied "inspiration." It then presumably lodges in the skull of the composer or songwriter, who feverishly jots it down or records it on a tiny digital device, and later claims, "It just came to me in a flash. I wrote the whole song in 23 seconds."

That's where music seems to come from. But the musical inspiration you enjoy actually comes to you courtesy of the parallel processing that goes on in certain integrated "modules" within the fascinating neuro-computational organ located inside your head.

Your brain processes music and also creates music.

So, what's a module?

It's a network of brain cells, a brain structure, that has evolved to carry out some specialized function. The Canadian cognitive psychologist Steven Pinker, in *How the Mind Works*, describes the mind as "what the brain does," or, more specifically,

> ...not a single organ but a system of organs, which we can think of as psychological faculties or mental modules.

Evidence from cognitive science, neuroscience, evolutionary biology, evolutionary psychology, and other disciplines points to the existence of numerous such brain structures. Possibly hundreds of them. A mental toolbox that enables you to survive and replicate your genes in your offspring.

Consider your body's architecture. You have many physical body parts, external and internal—hands, feet, lungs, heart, etc. You can easily identify numerous sub-parts as well: each of your hands has fingers, fingernails, knuckles, a thumb, palm, muscles, ligaments. Every normal human is born with these physical internal and external body parts.

The same applies to your brain's architecture. Even though you can't see your brain's modules, they're as real, and as different from each other, as your hands and your liver. And, like the rest of your body parts, you have these brain structures at birth.

All other humans on the planet are born with the same brain modules as you, just as they're born with the same internal and external body parts that make all of us identifiably human. And that means, as discussed later in this chapter, humans show remarkable similarities in behaviour in every culture globally.

Brain modules or faculties vary slightly from individual to individual, just as other body parts do. The feet you were born with, for example, have the same basic structure and anatomy as everybody else's feet. While easily identifiable as "feet," *your* feet vary slightly from everyone else's; they're identifiably yours.

Same with the mental faculties or modules you were born with. While each one performs the same specialized function in every human brain, your modules vary slightly from everyone else's. But, like your feet, your mental modules still perform in a recognizably human way. That's why human culture shows so much similarity everywhere in the world. And that includes musical similarity, discussed in more detail later in this chapter.

MULTIPLE INTELLIGENCES

What exactly is intelligence? Usually, it's defined as the ability to understand, reason, and solve problems. So IQ tests focus on logical and verbal abilities.

However, according to the theory of multiple intelligences (controversial, but nonetheless intriguing because it jibes with evidence that the mind has evolved as a complex modular system), humans have other kinds of intelligence—interpersonal intelligence, kinesthetic intelligence, visual intelligence, and so on. One of these is *musical* intelligence.

Most people excel at only one or two kinds of intelligence. For instance, if you're gifted as a musician, and also have an outstanding ability to empathize, then you might have

exceptional potential for writing songs—and yet score only average on a standard IQ test.

1.3.2
YOU WERE BORN WITH A PERSONALITY

The genetic code to build a head full of specialized modules evolved in response to selective pressure over millions of years. Being born with music-acquisition, language-acquisition and other skills and abilities already wired in your brain means you were born with a basic personality. You inherited it from your parents. But the personality you had at birth differed substantially from the personalities of your parents.

Your modular brain structures are not completely developed, connected, and constructed at birth. That's why it takes some time before you can talk and sing.

The same applies to other aspects of your development. It takes several years before your permanent teeth come in. If you're female, you don't begin to develop breasts until puberty. If you're male, you don't grow facial hair until then. Nevertheless, at birth, you have the brain wiring in place for all this to happen.

From childhood on, the surrounding culture shapes the personality you were born with, but does not replace it. The personality you have today owes its character partly to your genetic inheritance (perhaps half), and partly to your personal environment (perhaps half)—especially your peer group.

(NOTE: This does *not* mean that your genetic inheritance *causes* 50% of your personality and your peer group *causes* the other 50%. Instead, it refers to observed *variance* in measures of personality and behaviour due to diversity among individuals in all kinds of areas related to upbringing, such as education, religion, leisure activities, and so on.)

Genetic inheritance influences everyone's behaviour today, as it always has. That is, no matter how "enculturated" we humans think we've become, we have not by any means "outgrown our genes"!

1.3.3
MODULES AIN'T COMPUTERS

At birth, your brain came equipped with numerous pre-wired adaptations—precisely the opposite of a "blank slate" (more on this a bit later). Your brain does not function like a "general-purpose computer" with a single processor. As an example of the

inborn modular nature of the brain, consider the brain circuitry for modelling objects visually. It exists in the brains of all people at birth—*even people born blind*. That is, some people blind from birth can accurately draw objects in *proper 3-D visual perspective*, a skill they could not possibly learn from the surrounding culture. For example, a Turkish artist named Esref Armagan, who has been blind since birth, can paint realistic compositions of things he has never seen, with accurate three-point perspective and scale size.

Your brain's modular architecture does not resemble conventional computer design. Pinker again:

> The word 'module' brings to mind detachable snap-in components, and that is misleading. Mental modules are not likely to be visible to the naked eye as circumscribed territories on the surface of the brain, like the flank steak and rump roast on the supermarket cow display. A mental module probably looks more like roadkill, sprawling messily over the bulges and crevasses of the brain. Or it may be broken into regions that are interconnected by fibers that make the regions act as a unit...the metaphor of the mental module is a bit clumsy; a better one is Noam Chomsky's 'mental organ.'

If you own an ordinary desktop or notebook computer, it's a *serial* computer that mimics a parallel computer. Unlike your brain, a computer processor executes only one instruction at a time. But it does its work so fast that it usually fools you into thinking it's doing several things at once.

That's not how your brain works. Brain structures tend to evolve as specializations for various tasks, such as detecting danger, recognizing faces, protecting kin, mating, predicting the behaviour of others, and playing the harmonica for your horse.

Taken together, your brain's constituent modules do not function like a conventional computer. Nor like computer software. Nor like a mechanical clock. Rather, they connect up in vastly complex networks of neurons that communicate with each other and vie for your attention. Your brain is a massively *parallel* neural organ of computation, not a serial one. That is, unlike a small conventional human-made computer, your small conventional human brain processes information and interpretations using many different modules *simultaneously*. That's why you can drive your car, drink coffee, talk on your cell phone, *and* run over a pedestrian, all at the same time. Try programming a computer to do that!

1.3.4 EVIDENCE FOR BRAIN MODULARITY

Where does the evidence of brain modularity come from?

Studies of patients who have experienced brain lesions (structural changes in the brain) due to injury or disease reveal brain modularity. Many patients exhibit the same behavioural changes or deficits after suffering a brain lesion that occurs in the same physical area of the brain, often due to a stroke. Observations of the effects of injuries and diseases occurring in different parts of the brain have disclosed a number of modules.

Another source is measurement and observation of brain activity using positron emission tomography (PET) and functional magnetic resonance imaging (fMRI). These techniques reveal which specific parts of the brain are active during the performance of a mental or physical task. If, in many individuals, the same specific areas "light up" during the performance of the same task, it indicates a module or modules at work.

Some other information sources that scientists in a variety of specialties use to investigate the functioning of the brain's mental organs are:

- Observed effects of abnormalities in specific genes that implicate certain modules, such as the FOXP2 gene and language (discussed a bit later in this section)
- Observed effects of taking drugs that act on specific modules
- Optical and aural illusions that trigger conflicts between modules
- Studies of behaviour and abilities of newborns and pre-lingual infants—particularly useful in revealing the inborn, adaptive aspects of music
- Comparative studies of identical twins, fraternal twins, biological siblings, and adopted siblings
- Human behaviour studies that control for cultural variables (psychological experimentation)
- Findings from palaeontology—e.g., discovery of a 44,000-year-old bone flute at a Neanderthal site, indicating they had similar mental functioning in music as humans
- Findings from archaeology
- Studies of behaviour and learning in animals, especially our close primate cousins such as chimpanzees, bonobos, gorillas, gibbons
- Genome data—e. g., chimpanzees, bonobos, and humans share more than 98% of the same genetic material

The human brain took millions of years to evolve into an incredibly complex, powerful thing of beauty. Dissecting a cadaver's brain provides no information about the workings of the living, functioning brain. And neurosurgeons cannot open up skulls of living humans simply to poke, prod, and probe through all the billions of tangled microscopic neurons, to see how everything works. So evolutionary psychologists and biologists can and do use data from the sources listed above to, in effect, reverse engineer the brain as best they can.

MYTH OF 10% USE OF THE BRAIN

Perhaps the source of this myth is that, *at any given moment*, you only use a fraction of your entire brain. But throughout the day, you do use all of it.

If you're sitting down, you don't need to use the modules required to get you walking or running. If you're in a quiet room reading a book, you don't need to use your music-processing modules.

Your brain functions pretty efficiently. So you don't require the use of every module in your brain at every moment. Think of driving a car. You don't use your car's accelerator at every moment, nor the brakes, horn, radio, signal lights (some drivers never use them!), and so on.

You don't use all of your brain all of the time, but you certainly do *need* all of the modules in your brain. You do use all of them. Otherwise, they would not have evolved in the first place.

Brain modules are adaptations—*necessary* units of biological function—that evolve in response to selective pressure.

1.3.5 WHERE IN THE BRAIN? MUSIC MODULES IN INFANTS

If music were *not* a true adaptation, it would have had to have arisen only recently. However, the evidence indicates music probably predates our own species, *Homo sapiens*. That is, other hominid species, now extinct, such as *Homo neanderthalensis,* had music.

As well, neurological evidence supports the hypothesis that modules for creating and processing music exist in the brain at birth.

Setting aside lyrics for the moment and considering music only, most people think of the melody—the tune—as the essence of a piece of music.

- Harmony without melody or rhythm just doesn't work.
- Rhythm without melody or harmony gets tiresome after a while due to something called habituation (discussed in later chapters).
- But you can create palatable music with melody only—no harmony or regular beat (e. g., background music in film and television).

Infants perceive melodic patterns much as adults do. They respond to changes in melodic contour and changes in key like adults do, indicating genetic origins. Newborns have pre-wired neuronal circuitry to perceive the following (if you're not familiar with some of the musical terminology below, all will be revealed in the next few chapters):

- Melodic contour in both music and speech
- Consonant intervals (Chapter 4 goes into detail about intervals)
- Rhythmic patterns in both music and speech

Pre-lingual infants in all cultures can:

- Recognize changes in a melody
- Resolve tiny pitch differences (and small timing differences)
- Recognize the same melody even if sped up or slowed down
- Recognize the same melody when transposed to a different key
- Perceive diatonic tunes more easily than non-diatonic tunes
- Perceive consonant intervals more easily than dissonant intervals
- Respond to their mothers' melodious, song-like vocalizing to a much greater degree than their mothers' speech vocalizing
- Adapt to the musical conventions of whatever society they're born into

Culture modifies the expression of these predispositions, but the predispositions exist in the brain at birth (characteristic of adaptations).

Babies worldwide spontaneously initiate musical sound-play. Young children are forever inventing games and rhythmic play. Adults do not teach them this stuff. In fact, children have difficulty separating rhythmic body movements from music and singing until age four or five. Next time you observe a preschooler having a musical experience, notice how he or she jumps around, claps and makes other rhythmic gestures.

1.3.6 WHERE IN THE BRAIN? MODULARITY AND UNIVERSAL MUSICAL GRAMMAR

> Music can best be understood as a system of relationships between tones, just as language is a system of relationships between words.
>
> —ANTHONY STORR

Groups of inter-connected modules for processing music probably developed independently over time. Separate sub-modules likely process tone duration, pitch, loudness, and timbre. Interestingly, lesion studies indicate that separate modules even process the closely-related elements, meter and rhythm.

Pitch patterns that group hierarchically (discussed in Chapter 8) appear to form the basis of musical *syntax* (set of musically "grammatical" rules).

Our brains have a genetically determined ability to create, learn, and process language, called "Universal Grammar," one of Noam Chomsky's seminal discoveries in linguistics. It appears that our brains also have a genetically determined specialization for music. Fred Lerdahl and Ray Jackendoff, who co-authored a classic book on the subject, labelled it Universal Musical Grammar. They were inspired to a degree by the Polish music theorist Heinrich Schenker.

However, just as people learn a specific language in childhood and don't understand other languages without learning them, so people learn specific musical styles of their culture and don't understand the musical styles of other cultures without learning them.

On the other hand, musical universals bespeak the genetic underpinnings of all music (musical universals are listed a bit later). If you make music that breaks the brain's inborn rules, regardless of culture, the music you make will likely not appeal to more than a handful of humans.

If you play recordings of bird songs of different species to young songbirds raised in captivity, they will only learn the songs of their own species, evidence of genetic origins. Blackbirds in captivity, no matter how much loving care and patient training

they receive, stubbornly refuse to learn the Lennon-McCartney tune "Blackbird," because a blackbird did not write the song.

The same appears to apply to human infants. Human babies recognize and learn speech and melodies characteristic of the human species, rather than a particular culture. If you learn two languages in childhood, you'll learn both effortlessly and speak both without an accent as an adult. But if you learn one language in childhood and a second language as an adult, you will learn the first language effortlessly and speak it without an accent, and the second only with considerable effort, and speak it with an accent.

Since all of the world's musics share a set of universals, like languages, it's likely that this phenomenon applies to musical cultures. Suppose you have grown up learning the tonal system of the West, with little exposure to the tonal system of, say, India. And suppose, as an adult, you decide to move to India and learn to play the sitar. You'll probably find yourself expending considerable effort to learn what young Indian sitar players seem to learn effortlessly. And, after some years of training, you will likely play the instrument "with an accent," so to speak, compared with native-born players of your age and musical experience. (Try it!)

1.3.7 WHERE IN THE BRAIN? LATERALIZATION IN ANIMALS AND HUMANS

Brain lateralization refers to the location of neuronal circuitry for specific skills and behaviours in either the left or the right hemisphere of the brain. Handedness reveals brain lateralization, or lack of it, in a clear way. In most species, handedness—favouring the right or left hand, hoof, wing, paw—is non-committal. For example, you'll find left- and right-handedness equally distributed in chimpanzees and other apes. A few animals other than humans have pronounced handedness, such as the walrus, of all creatures.

Humans manifest extremely specialized right-handedness, reflecting the importance of left-brain sequencing and left-brain language adaptations. Humans probably communicated symbolically with hand gestures before, and during the process of, converting to symbolic spoken language.

Brain lateralization in humans may have resulted from growing numbers and complexities of modular specializations competing for space as the brain swelled in size in response to selective pressure to cope with larger and more complex human social organization. *Something* related to the social nature of humans drove the huge expansion of the brain. It could well have been either music or language.

The left hemisphere tries to solve problems and processes sequential patterns, including language and rhythm. It's also active in positive emotional processing.

The right hemisphere has modules for, among other things, spatial cognition and the interpretation of harmony.

WHY MOM HOLDS BABY ON THE LEFT

Why does Mom hold baby with baby's head on Mom's left side? It's not because of a connection the baby feels with Mom's heartbeat. And it also has nothing to do with right-handedness versus left-handedness. Left-handed mothers also tend to hold their babies on the left.

It has to do with brain specialization for emotional processing. As you know, the brain's right hemisphere connects to *left* body functions, and vice-versa. The right hemisphere is active in *negative-emotion processing* (fear, sadness). So the right hemisphere of Mom's brain (and Dad's brain, too), wired to her *left* field of vision and hearing, can more sensitively attune to her infant's negative emotional signals, enabling Mom to take action accordingly. Baby can't talk yet, so mother-child communication is necessarily completely emotional.

By the way, this is why, when you're talking to someone, you look at their *right* eye (your left field of vision), not their left eye.

The brain has roughly 10 billion neurons (nerve cells). Although women have smaller brains than men, women's brains have significantly more neurons per unit of cortex than men's brains (up to 12% more). And women's brains have a somewhat different organizational architecture than men's brains. In any case, sheer brain size doesn't seem to matter much in humans. Albert Einstein's brain weighed *less* than the average adult male brain.

The overall architecture of your brain mimics the architecture of the rest of your body: a mirror-image pair of everything on each side, but only one of the things in the middle. You have one corpus callosum, the main bundle of nerves (there are others) that connects the left and right hemispheres. If you're a woman, your corpus callosum is quite a bit larger than it is in the brain of a man. This may account for the superior ability of women to reconcile conflicting left-right brain analyses of situations.

The female brain is significantly less lateralized than the male brain. Functional modules are more globally distributed.

Female and male humans have different attitudes and behave differently because of differences in evolved brain functions, wired-in from birth (more on this later in the chapter). Apparently, this fact still stirs controversy.

1.3.8 WHERE IN THE BRAIN? LATERALIZATION AND MUSIC

The common belief that the right hemisphere processes music and the left processes language does not hold up.

If Doc Yada-Yadams, a fully qualified neurosurgeon, were to sedate the left hemisphere of your brain (don't try this at home), you would likely be able to sing a song (i.e., melody *with words*), but would not be able to speak. If the Doc sedated your right hemisphere, you would be able to speak, but not sing.

Language and music "time-share" many characteristics in both hemispheres. Singing tends to be more right-hemisphere, with speech more left-hemisphere. Both the left and right hemispheres appear to process pitch intervals.

Most people have a preferred listening ear, usually the right ear, which is connected to the speech-processing left hemisphere. When you answer the phone, you usually use your right ear.

In male musicians, music shows much more lateralized processing in the brain, compared with female musicians.

As for modularity, whether they're in the right, left, or both hemispheres, separate modules apparently process the time-based elements of music (meter, rhythm), compared with the melodic elements (pitch, intervals). No one knows exactly how many modules do the work.

Professional musicians show left-hemisphere dominance for music, amateurs right-hemisphere, probably because trained musicians approach music more analytically. As well, highly skilled musicians appear to use a significantly larger proportion of the brain in processing music than do people who listen to music but don't play.

In broad terms, the evidence on brain lateralization in music processing indicates the following (Table 1):

TABLE 1 Brain Lateralization In Music Processing

Left hemisphere (connected to right ear and right side of body) processes:	Right hemisphere (connected to left ear and left side of body) processes:
• Time-based elements of music (rhythm) using sequence-processing modules	• Pitch-based elements such as the shape of a melody (melodic contour) and tonal patterns
• Rhythmic aspects of melody	• Harmony; the right hemisphere is better at spatial cognition; in a sense, the right hemisphere processes pitch and harmony as "spatial" elements of sound
• Rapidly-changing information such as speech—*sequences* of words.	• The emotional tone of voice (via the left ear, which is connected to the right hemisphere) better than the left hemisphere

Brain Lateralization and Music Mixing

Record producers and recording engineers, if they know what they're doing, take into account brain lateralization in producing a stereo mix:

- Rhythm-heavy tracks sound more natural if biassed a little to the right speaker (right ear; left brain hemisphere).
- Harmony-rich tracks sound better if biassed a little to the left speaker (left ear; right brain hemisphere).
- Tracks requiring both melodic and rhythmic processing, such as lead vocals (including rapping, which has a lot of melodic content), sound better in the middle.
- If lyric intelligibility is a problem, right-speaker bias may help, as the right ear is connected to the speech- and sequence-processing left hemisphere.

1.3.9
WHERE IN THE BRAIN? AMUSIA

> Some may say that I couldn't sing, but no one can say that I didn't sing
> —FLORENCE FOSTER JENKINS, arguably one of the world's worst singers

Amusia is the scientific term for what most people call tone deafness and other "musical brain" disorders. It refers to any of several disorders that result in loss of ability to create music, or to perceive and understand music (or both).

Sometimes brain trauma causes amusia. Sometimes disease triggers it. Sometimes it's congenital. If you have *congenital amusia*, you're born without the normal brain wiring to process pitch and rhythm. Consequently you can't sing in tune or tap in time with a steady beat (you can't entrain). Amusia is not common; it is believed to affect only about 5% of the population. Florence Foster Jenkins may have had congenital amusia.

Stroke victims develop *acquired* or *receptive amusia* if they suffer brain damage to modules that process music. If you develop amusia this way, you can recognize the lyrics of a song you had known before you acquired amusia—but only when somebody *speaks* the lyrics to you. If they *sing* the lyrics, you can no longer recognize the tune. You have a hard time grasping or perceiving music. You can't follow a melody, identify the sounds of various musical instruments, or make sense of chords.

Expressive amusia refers to the inability to create music by singing in tune, or entrain to an external source of music by tapping in time. However, if you have expressive amusia, you can usually still enjoy and understand music, and even remember tunes.

1.3.10
WHERE IN THE BRAIN? MODULARITY AND UNIVERSAL LINGUISTIC GRAMMAR

> The ability to acquire and use language is a species-specific human activity.
>
> —NOAM CHOMSKY

Since this book deals with lyrics (Chapter 10) as well as music, it's fitting right about now to have a quick look at the whereabouts and identity of language in the brain.

In the 1950s, the American linguist Noam Chomsky proposed that language was located as a module or system of modules in the brain. Turns out he was right. His work was a turning point in the cognitive revolution and the downfall of behaviourism, the doctrine that humans have blank-slate brains at birth.

According to Chomsky, a generative grammar—a set of language rules—is encoded in the neuronal architecture of the brain, and is present at birth. Brain wiring for generative grammar makes it possible for young children to automatically become fluent in any language they are exposed to, effortlessly, and without the need for adult teaching. Literacy has nothing to do with language learning. Illiterate people worldwide have no difficulty communicating orally at the same grammatical level as those around them.

If you were born in Dodge City but raised from infancy in the Canadian Arctic, you would grow up speaking Inuktitut. If you were born an Inuit in the far north but raised from infancy in Dodge, you would speak English, grow luxuriant flowing hair, and sing Classic Western songs about lost love and horses. With a Kansas accent.

Unlike your vocabulary, you don't have to learn your "mental grammar," as it's called. You were born with it. That's why, long before you started school, you already knew the difference between, "Mommy plays the piano," and "The piano plays Mommy," even though both sentences use the same four words. Universal Grammar means your brain automatically rejects patterns such as these:

- Plays piano the Mommy
- Piano the Mommy plays
- The plays Mommy piano
- Piano Mommy plays the

and so on. Your brain has evolved the miraculous capacity to automatically distinguish a "thing" (noun) from an "action" (verb) from a "qualifier" (adjective, adverb, determiner). So, even if you *never go to school* and learn so-called "proper grammar," you will speak in grammatically correct sentences, indistinguishable from the sentences spoken by others in your society who have had the benefit of a formal education. "Proper grammar" is built into your brain.

Chomsky's generative grammar theory has had an enormous impact in all of the cognitive sciences (i.e., sciences concerned with perception, intelligence, learning, and other aspects of mental function), not just the specialties relating to language. Scientists have since discovered many other modular adaptations throughout the brain.

Every language in the world has the same design features. That is, although languages seem to have completely different syntaxes (grammatical rules), close analysis shows that all languages share the same deep structure. For example, all languages have verbs and nouns and either a subject-object or object-subject order.

Since people of many cultures create languages independently, this means the capacity for acquiring and using language must have a genetic basis. Language appears to have its own neural architecture, or set of modules and sub-modules. These modules operate independently of other cognitive functions such as perception, reasoning, and knowledge-acquisition.

The brain has the innate capacity to easily store words and their meanings, as well as the rules or patterns that recognize word types and word orders (I. e., grammar). Our mental dictionary and our mental grammar, while independent, work together in the parallel-processing neural organ of computation that is the human brain.

Dramatic evidence supporting the theory that the ability to create language from scratch is pre-wired in the brain at birth comes from studies of two sign languages in widely separated populations of deaf people, one in Israel, the other in Nicaragua. In these two populations, people created new languages from scratch, languages that could not possibly have been transmitted culturally. Linguists discovered that both languages function by the same grammatical rules as languages worldwide. The only difference is the channel of transmission of meaning—via signing instead of speaking.

Although selective pressure drove evolution of the brain adaptation for spoken language, which all humans use today, the same does not apply to written language, which only *some* humans have. To acquire written language, you have to learn it, because it's a technological development, not an adaptation. (Written language emerged from idiographic representations of spoken language.)

THE STROOP EFFECT: MODULES IN CONFLICT

Your brain's many modules are specialized to perform different tasks. The Stroop effect demonstrates how the information arising from the processing of different modules can cause interference.

Here are 25 words. Time yourself reading the words *aloud*, left to right, line by line, without errors: "grey, black, white," etc.

GREY	BLACK	WHITE	WHITE	BLACK
GREY	BLACK	GREY	BLACK	WHITE
BLACK	GREY	BLACK	BLACK	GREY
WHITE	WHITE	GREY	WHITE	GREY
GREY	BLACK	WHITE	WHITE	BLACK

Now time yourself reading the COLOR of each of the 25 words aloud, left to right, line by line. For example, the first three

words would be "black, white, grey." Not so easy this time—it takes considerably longer.

How come?

The American psychologist John Ridley Stroop devised this test in the 1930s to demonstrate the interference effect your brain experiences when linguistic information conflicts with information from other senses.

When you ignore color and simply read the words, you only need to use your language processing system, so it's easy to say each word aloud. But when you try to say the *color* of each word, your brain's executive system discerns a conflict between what your color processing modules are telling you and what your language processing modules are telling you about the meanings of the words associated with the colors. Two different kinds of information are entangled.

To sort out the conflicting information, you have to first suppress the meaning of each word normally associated with the sequence of letters. This takes some effort. Then you have to translate the color of each group of letters into the word with the meaning that matches the color. Only then can you say the correct word.

Primates such as gorillas, chimpanzees, and bonobos do not develop any kind of language-like communication system in the wild. They lack the language brain modules that humans are born with. However, in captivity, with much time and effort, trainers can get them to understand, in a rudimentary way, that arbitrary symbols represent objects. Apes can also "learn" elementary grammar-like rules, such as linking two symbols representing something different from either of the individual symbols. With about 30 years of patient training, a great ape can memorize a couple of hundred word meanings, and can almost acquire the language understanding of an 18-month-old human child. Bonobos fare somewhat better at "language learning" than chimpanzees.

1.3.11 WHERE IN THE BRAIN? FOXP2 AND MYH16

In 1990, Steven Pinker hypothesized that language evolved in humans by conventional Darwinian natural selection (Section 1.5 discusses natural selection). Chomsky, who first described brain-based universal grammar, did not go that far.

Twelve years later, in 2002, a team of German and British geneticists published genetic evidence strongly supporting Pinker. They discovered that a particular gene, FOXP2, plays a vital role in processing speech and grammar.

FOXP2 exists in other primates such as the chimpanzee, but the human form of the gene differs. The human form may have appeared 100,000 to 200,000 years ago. Communication by language gradually replaced communication by gesture. Language was the breakthrough technology that resulted in symbolic thinking and the cultural explosion that defines what it is to be human.

If you happen to be born with abnormal human FOXP2, you will suffer from severe language impairment. That means that the normal human form is a naturally selected *mutation*, a "target of natural selection." (A mutation is a randomly occurring change in the gene, resulting in a change in physiology or anatomy or even behaviour.) And that strongly indicates that the innate human capacity for effortless language learning is an adaptation, the product of Darwinian natural selection.

About two million years ago, the hominid brain suddenly (in glacial evolutionary terms) began to get larger and larger, a process called *encephalation*. This did not occur in any of the other large primates, such as chimpanzees and gorillas. A mutation occurred in hominids around that time, a mutation that may have made encephalation possible.

A gene called MYH16, active in chimpanzees, ensures huge jaw muscle build-up, necessary for powerful chewing. These muscles constrict the skull, something like bungee cords, preventing growth in cranial capacity. In hominids, a mutation appeared line that *deactivated* MYH16. This may have freed the hominid skull to expand. And expand it did, tripling in size over the next 2 million years. To this day, chimpanzees still have the active version of MYH16 and comparatively small skulls. All humans have the deactivated human mutation of MYH16 and comparatively huge skulls.

As well, there's evidence of a connection between MYH16 and FOXP2. It turns out that if you have abnormal human FOXP2, you not only have grave cognitive language difficulties, but you also have physical problems with your mouth and jaw muscles.

Taken together, the uniquely human variants of MYH16 and FOXP2 look like smoking-gun mutations with respect to encephalation and language development.

1.3.12
WHERE IN THE BRAIN? APHASIA

Aphasia is the language equivalent of amusia, discussed a bit earlier. Aphasia refers to any of several disorders that result in loss of ability to communicate in speech or writing (or both). There are two main types:

1. Broca's Aphasia (also called *expressive aphasia*):

- If you have a stroke or otherwise suffer damage to a specific area of the left hemisphere called *Broca's area*, you will have difficulty speaking. However, the content of what you're saying, slow and disjointed as it may come out, will make sense.

- Interestingly, if you have Broca's aphasia, you will have great difficulty reciting or speaking the words of a song you had learned before developing aphasia, but will usually be able to *sing* the words fluently.

2. Wernicke's Aphasia (also called *fluent aphasia*):

- If you have a stroke or otherwise suffer damage to an area of the left hemisphere called *Wernicke's area*, you will be able to speak fluently, but the content of what you're saying will not make sense.

- Numerous politicians, some defence attorneys, Ann Coulter, television evangelists, many advertising copywriters, talk radio hosts, and talk radio callers appear to suffer from Wernicke's aphasia.

1.3.13 THE COMBINATORIAL NATURE OF MUSIC AND LANGUAGE

Chomsky pointed out the following:

- Pretty much every sentence that everyone utters is a different combination of words, never heard before.

- That means it's impossible to store all sentences in the brain.

- That means the brain must have a mechanism for putting words together in a meaningful way.

- That means the brain can tell the difference between a group of words that makes sense, and a group of words that pickles without lamented occidental Custer's stapler.

Here's how Steven Pinker describes the combinatorial nature of the brain's language module:

> A finite number of discrete elements (in this case, words) are sampled, combined, and permuted to create larger structures (in this case, sentences) with properties that are quite distinct from those of their elements. For example, the meaning of *Man bites dog* is different from the meaning of the same words combined in reverse order.

It's possible, therefore, to construct a practically infinite number of sentences with a relatively limited vocabulary.

The same applies to music:

- A scale has a finite number of different pitches.
- Each pitch can last for a finite number of different time values.
- Each pitch can be combined with a finite number of other pitches to create a finite number of intervals and chords. And so on.

Even though each type of musical property (melody, harmony, rhythm) has a finite number of elements, when you multiply out all the possibilities, you get a practically infinite number of possible tunes a songwriter could write. That's what *combinatorial* means.

- Chomsky's universal generative linguistic grammar describes the brain's ability to compile an inventory of words and apply a set of combinatorial rules.
- Lerdahl and Jackendoff's universal generative musical grammar describes the brain's ability to compile an inventory of *tones* and apply a set of combinatorial rules.

The whole human brain is a combinatorial system, a parallel-processing neural organ of computation. Using mentalese (described below), a discrete number of mental symbols can be combined and recombined, using as many modules and sub-modules as necessary. In other words, humans have the ability to think up, or imagine, an almost infinite number of possibilities, because thought is itself combinatorial. That's why behaviour is infinitely variable.

Both music and language use small numbers of elements to generate an infinite number of combinations of word phrases and musical phrases. Therefore, it's likely that the brain function of combinatoriality evolved before the evolution of separate music and language specialties.

THE GENETIC CODE IS LIKE LANGUAGE

The genetic code, like language, is combinatorial. That's why every bacterium, plant and creature is genetically different, even within the same species, and even though each uses the same 64 three-letter DNA "words."

Here are some analogies between language and the genetic code:

Language	Genetic Code
LETTERS 26 letters (symbols), A, B, C, etc.	**NUCLEOTIDES** 4 nucleotides: cytosine, guanine, adenine, and thymine
WORDS A word consists of one or more letters. Thousands of words are in a dictionary. Speech and written documents are comprised of words from the dictionary.	**CODONS** A codon consists of three adjacent nucleotides. 64 codons form the genetic dictionary. All living things use the same 64-codon dictionary.
SENTENCES Sequences of words are called sentences or lines of poetry, etc. They code meaningful representations of thought.	**GENES** Sequences of codons—strands of DNA—are called *genes*. They code chains of amino acid molecules called *proteins*, which comprise various body parts.
CHAPTERS Many sentences form a larger unit called a chapter.	**CHROMOSOMES** Many genes form a long strand of DNA called a chromosome.

BOOK	**GENOME**
All of the chapters containing all of the sentences form a book—perhaps 10,000 sentences.	All of the chromosomes, containing all of the genes, form the genome of the organism. Humans have 23 *pairs* of chromosomes, one member of each pair from each parent. The human genome consists of some 20,000 to 25,000 genes.

The fact that all life on earth is based on the same 64-codon DNA dictionary makes it a virtual certainty that all life, all microbes, plants, and animals that have ever existed—dinosaurs, oysters, apple trees, sharks, daffodils, rats, chimpanzees, and humans—evolved from the same single molecular strand, a monad (first simple organism) that fused, through natural chemical mechanisms, from non-living molecules nearly 4 billion years ago.

1.3.14 HOW PLASTIC IS *YOUR* BRAIN?

The human brain exhibits some degree of *plasticity*. For example, a young child who trains as a pianist experiences some modification in the cortex as a result of that musical training.

While your brain is in some measure, "adapted to adapt," plasticity does *not* mean your brain consists of a lot of generalized matter that can do pretty much anything. Plasticity simply means a module can take on some functioning for which it was not specifically adapted, provided that functioning relates to what the module would ordinarily do.

Cross-modal plasticity refers to the ability of your brain's modules to reorganize themselves somewhat to take advantage of cortical modules not being used due to sensory loss. For example, loss or absence of vision can stimulate some brain module reorganization, enhancing a blind person's sense of pitch and direction. Blind individuals often have extraordinary musical skills.

The effect of plasticity is much more evident in childhood. In blind people, pitch discrimination (the ability to judge the direction of extremely rapid pitch change) is much keener than in sighted people, especially if the individual became blind before the age of two. It's easier to learn to play a musical instrument or to speak more than one language in childhood because the brain is receptive to applying its built-in music

and language processing modules to *any* language and *any* musical culture during childhood. After a period of time, called the *critical period*, plasticity diminishes sharply as the various modules become fully functional. If you don't learn early, your brain is pre-wired to move on to the next stage, and you lose the window of opportunity.

1.3.15 MENTALESE: THINKING WITHOUT LANGUAGE

Contrary to popular mythology, the language you speak does not mould or shape the way you think. An Arabic-speaking person, for example, does not "think differently" from the way an English-speaking person thinks.

You do not even need language to think.

Humans (and other animals) use a "brain language," the language of thought, usually called *mentalese*. If thoughts depended on words, nobody would be able to translate anything from one language to another. The words of the French language do not all have exact equivalents in, say, English. The translation, then, is *thought for thought*, not word for word. The translator uses mentalese to make decisions on how to structure the thoughts across the languages.

You, like everybody, sometimes have problems putting thoughts into words. That's not because your thoughts don't exist; of course they do. Putting them into words means translating mentalese into language. That can be a chore.

When you finish reading this chapter of this book, you might remember only one or two of the specific sentences. But that does not mean you will have forgotten the content of the chapter (unless you haven't been paying attention). What you will remember is the *gist* of this chapter. You will easily be able give your friends a fairly detailed oral summary of the chapter (and urge them in the strongest possible terms to buy this interesting and highly informative book), but you will not likely use any of the exact sentences you read in this chapter, because you won't remember them.

You will remember the gist of this chapter in mentalese, the language of thought. The same applies to other experiences you have, such as seeing a movie or attending a party. Not only do you absorb the gist of the story line as revealed in the dialogue of the movie (or conversations you had at the party), but you also remember information that other modules have captured during the experience, such as the visual and auditory elements. Later, you can describe not only the gist of the dialogue, but also the gist of the visual setting, the soundscape, and how the experience made you feel emotionally. Mentalese captures the gist of all of this. You don't store all of it permanently, of course; memories fade over time. Chapter 7 discusses the various types and functions of memory.

Similarly, you can identify a familiar piece of music, even though you hear it in a completely transformed arrangement, played with unfamiliar instruments. You

recognize the unfamiliar rendition because you retain the *gist* of it. For example, you can recognize "My Favourite Things" from *The Sound of Music* even if it's played in a jazz arrangement you've never heard before. By John Coltrane.

Humans, of all the animal species on this planet, have the largest brain proportion comprised of neocortex (80% of the whole brain). However other animals also have a neocortex brain part, which means they, too, think—even though they don't have language. Your dog thinks. Your horse thinks. The mountain lion that has been tracking you and your horse thinks. She thinks (translated from mentalese), "Easy dinner or what?"

1.3.16
ANIMAL INTELLIGENCE AND CULTURE

Evolutionary conservation means that, even after a species splits into two species (then splits again and again) due to environmental selective pressures that differ in geographically separated populations, many traits continue on in each species. For example, we humans share most of our genetic material with chimpanzees and bonobos, and we also share many chimpanzee and bonobo behavioural traits, even though the last common ancestor of apes and humans lived some six or seven million years ago.

All species, including humans, evolved from a common ancestor. So it's not surprising to find examples of human-like "mindfulness" in species other than humans. Lots of species make tools spontaneously, without any instruction from other adults of their species (or humans). Some species can learn to make tools, as well (cultural transmission).

Animals don't compose human-like music, and few appreciate Coltrane, Joni Mitchell, or the harmonica music that comes wafting out of nowhere when Marshal McDillon, Deputy Fester, and Ms Puma are sitting around the campfire roasting squirrels. However, some animals have recognizable cultural traits.

A few examples:

- Monkeys and apes in captivity, including chimpanzees, gorillas, orangutans, and capuchin monkeys, like to paint pictures. Some can produce recognizable shapes such as crosses, circles, and non-random patterns.

- Dogs can learn word meanings after a single exposure (called *fast mapping*, which is how children pick up vocabulary so quickly) and fetch specific objects from verbal commands only.

- Chimps, bonobos, and gorillas, with a lot of training, can learn to associate some words with some objects. (However, they don't even begin to "get" the symbolic essence of language.)

- Capuchin monkeys can learn to use money. Male capuchins even purchase sex with money.

- Ravens and apes deliberately cheat or fool each other when it's advantageous.

- Chimpanzees use tools and teach tool-making and tool-use to other chimpanzees.

- Crows make and use tools without being taught by other crows or by humans.

- Male zebra finches are aware of the social relationships of others of their species, and modify their relationships with females accordingly.

- Baboons can transmit local baboon cultural practices to outsider baboons who join the troop.

- If you whisper the right things in your horse's ear, you can lead him to water *and* make him float on his back.

1.3.17 NOWHERE IN THE BRAIN: THE "BLANK SLATE" MYTH

> Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors.
>
> —JOHN WATSON, father of behaviourism

In the first half of the 20th Century, and well into the second half, a school of thought called *behaviourism* taught, wrongly, that

- Humans are born with "blank slate" brains, and

- Everything we learn comes from the punishments and rewards we receive from the environment.

Behaviourists conveniently forgot to explain how a blank slate brain could actually learn anything: a truly blank slate would have no mechanism for learning. If the brain were a blank slate at birth, you would not be able to learn either language or music.

According to behaviorists, observing behaviour from the outside, via stimulus and response, was the only valid way to proceed in psychology. Behaviourists believed that biology controlled animals, but culture controlled people. Presumably, behaviourists did not consider people to be animals.

(Perhaps the Jesuits invented behaviourism, as evidenced in their oft-quoted myth: "Give me the child until the age of seven, and I will give you the man.")

Many people still believe in behaviourism, even in the face of mountains of evidence supporting the existence, at birth, of a wide variety of naturally selected brain adaptations such as those for the acquisition of language and music. Some academics even teach that cultural evolution has superceded biological evolution.

For example, even today, "social constructionists" cling to the Standard Social Science Model, the dogma that biology doesn't matter. In the minds of social constructionists, a biological trait such as the state of being male or female—your *gender*—arises somehow through the prevailing culture's "social construction." That is, social constructionists actually believe you are not born male or female, you "learn" your gender, and you "learn" your sexual orientation.

This makes about as much sense as insisting people are born with "blank slate" bodies. At birth, humans have a head (containing a blank slate brain, of course) that's attached to a formless blank slate body. A blob. When you're born, presumably, the attending obstetrician or midwife begins to shape you—a blob—into a torso, then arms and legs and fingers and toes. Others in the social environment join in, shaping other bits of you-the-blob into your heart and lungs and, let's not forget, your naughty bits. Over the years, society colonizes and socially constructs your blank slate brain and teaches you what gender you are...

Thinking about the brain and behaviour has changed since the days of the behaviourists, as summarized by the cognitive neuroscientist, Michael S. Gazzaniga:

> No scientist seriously questions whether we are the product of natural selection. We are a finely honed machine that has amazing capacities for learning and inventiveness. Yet these capacities were not picked up at a local bookstore or developed from everyday experience. The abilities to learn and think come with our brains. The knowledge we acquire with these devices results from interactions with our culture. But the devices come with the brain, just as the brakes come with the car.

1.3.18
CULTURAL RELATIVISM

Believers in the Standard Social Science Model refuse to make value judgments about anything that goes on in a culture other than their own. This is called *cultural relativism* or the *relativistic fallacy.* It's really moral relativism, although believers in cultural relativism deny it.

According to cultural relativism, all cultures are "equal." So you must not condemn the practices of any culture other than your own. Practices such as barring women from positions of social, political, or religious power. Banning music. Arranging and forcing marriages between three-year-old children. Ostracising, torturing, or executing homosexuals. Cultural relativists insist that, if you're an outsider, you have no business criticizing such cultural practices. If you do, you're an intolerant, ethnocentric racist bigot.

Cultural relativists assume, contrary to empirical evidence, that:

1. Culture creates the individual instead of the other way around, and

2. People do not have shared cultural values, the same biologically-driven wants, needs, and aspirations everywhere in the world, regardless of culture.

Cultural relativists simply deny, in the face of all evidence, that there's any such thing as human nature—a large group of inborn behavioural traits that are common to people of all cultures. According to cultural relativists, everything's political. Everything's subjective. There's no such thing as an objective fact.

The implication of cultural relativism is that universal, inborn ethical or moral standards do not exist. Cultural relativism is based on the mistaken notion that people *learn* morality and therefore you ought to expect people in different cultures to have different senses of morality.

The evidence, however, indicates every normal member of the human species is born with an evolved moral sense. Morality is not something you acquire from your culture. You don't learn morality from your Mom or by attending your local church, mosque, or synagogue. Atheists, agnostics, and orphans behave just as morally as everybody else in society.

1.3.19
A DESERT ISLAND THOUGHT EXPERIMENT

Consider what would happen in the following hypothetical situation, proposed by the anthropologist, Robin Fox.

Suppose a population of children were to find itself in total social isolation, having to raise themselves, without ever having had any contact with adults and a pre-existing culture. No previous enculturation whatsoever. Impossible in real life, of course, because we humans need others to feed and nurture us for a long time until we become self-sustaining. But this is only a thought experiment— nobody will die of starvation or exposure.

What would happen? Because humans have inborn brain adaptations, including adaptations for language and music, the individuals making up this hypothetical culture-free society would *create culture*, just as individual humans create culture everywhere in the world. The society would, among other things:

- Generate a language
- Have music
- Have dancing
- Create a legal system
- Create the institution of marriage
- Create systems of social status
- Proclaim and enforce taboos, such as the incest taboo
- Create some sort of religious faith, complete with ceremony and ritual
- Make and use tools and weapons
- Exclude women from various practices and institutions
- Have homosexual citizens
- Find itself inventing ways of coping with adultery, murder, suicide, psychosis, etc.

1.3.20
THE NONSENSE OF BIOLOGICAL DETERMINISM AND SOCIAL DETERMINISM

People who don't understand what evolutionary biology and evolutionary psychology are about fear they might be about biological determinism, the doctrine that your genes determine 100% of your abilities and behaviour, summoning ugly spectres of racism, eugenics, social Darwinism, and the like.

The scientific evidence does not support biological determinism, and no sane biologist embraces the concept. Its opposite, social determinism, the doctrine that society alone socially constructs 100% of your abilities and behaviour, also has no scientific support.

Evolutionary biology and psychology seek to understand what humans have *in common* as a species, not how we differ as individuals. This means taking into account the interactions between our biological adaptations and our cultural

environment. Evolution by conventional Darwinian natural selection created humans and all other living things on earth, past and present. Therefore, genetically inherited predispositions influence human behaviour as much as learning and cultural influences. *Both genes and culture matter.*

Moreover, you have the ability to *override* your genetically programmed inclinations. You have free will. For example, you can live and work in tall buildings with floor-to-ceiling windows, overriding your genetically inherited fear of heights. You can ride in an elevator despite natural claustrophobia.

The ability to override genetically inherited predispositions invalidates excuses, such as:

- I smashed that other guy's car with a tire iron in a fit of road rage because, as a human male, I'm naturally aggressive.
- I can't become a physicist because, as a human female, I'm not supposed to be good at math.
- I keep having affairs because, as a naturally polygynous human male, I just *have* to sow my wild oats.
- I eat wild oats from the nosebags of other horses because, as a horse instead of a human, I have no evolved ethical sense, only horse sense.

SOCIAL DARWINISM: SPIN-DOCTORING SCIENCE

Social Darwinism is the notion that the same principle of natural selection that applies to biological evolution extends to individual and group behaviour—even though no evidence supports any such extension.

Political and social thinkers of the late 19th Century concocted the idea of social Darwinism: *superior* social and racial classes and systems succeed and survive, while *inferior* social and racial classes and systems fail and ought to die out. So, for example, you should not help sick or disabled people because if you did, you would interfere with the natural process of evolution. Social Darwinism was used to justify imperialism, racism, eugenics, and genocide.

Darwin himself never made any claims that natural selection applied to anything other than biological evolution. Nor do today's evolutionary biologists.

1.3.21
HUMAN UNIVERSALS

Humans have so many naturally-selected behavioural characteristics in common, regardless of culture, that the anthropologist Donald E. Brown documented hundreds of them in a book, *Human Universals*. These include *musical universals*, coming up in a few minutes.

Brown describes the human species as Universal People, a nod to Chomsky's Universal Grammar. Here are a few from Brown's and others' compilations of human universals, the things you find in all cultures worldwide (Table 2):

TABLE 2 A Small Sampling of Human Universals

- Aesthetics
- Conflict and conflict mediation
- Cooking
- Death rituals
- Distinguishing right and wrong
- Division of labour by age and by sex
- Ethnocentrism
- Facial expressions of emotions, including happiness, fear, sadness, disgust, etc.
- Fairness (equity) concept
- Family (or household)
- Females do most child care
- Food sharing
- Good and bad distinguished
- Gossip
- Groups that are not based on family
- Hospitality
- Jokes
- Kinship statuses
- Language employed to manipulate, misinform, or mislead
- Law (rights and obligations)
- Love and affection felt and expressed
- Magic, belief in
- Males dominate public/political realm, more aggressive, more prone to lethal violence, engage in more coalitional violence, and more prone to theft
- Marriage (husband older than wife on average)
- Mentalese
- Moral sentiments
- Murder and murder proscribed
- Oligarchy
- Preference for own children and close kin (nepotism)
- Rape; rape proscribed
- Reciprocity, positive and negative (revenge, retaliation)
- Religion/supernatural, belief in
- Resistance to dominance and abuse of power
- Risk taking (males)
- Sanctions for crimes against the collectivity
- Self control
- Sex (gender) terminology is fundamentally binary
- Sexual attractiveness, jealousy, modesty, and regulation
- Social structure
- Statuses on other than sex, age, or kinship bases
- Taboos, including food, incest, utterances
- Territoriality
- Weapons

These are only a few that Brown (and others) have documented. Brown's book lists many more. These traits exist in every culture, however separated geographically and historically. Obviously, such commonality of characteristics could not have emerged independently everywhere in humanity without genetic foundations—an evolved basic human nature.

1.3.22 "THE GENES HOLD CULTURE ON A LEASH"

Does culture, including music and language, create human behaviour, or does human behaviour create culture?

Culture is what we learn from each other. It applies to both humans and to non-human animals that have culture (and many do).

But where does human culture come from in the first place?

According to outmoded, biologically-unsupported thinking:

- Human babies are formless blank slates at birth.
- Therefore human culture comes from the "outside."
- Culture completely creates the human individual; the individual is the "product" of his or her culture.
- Cultural or social transformation can change the essential nature of people (this is precisely what ideologues, such as a political and religious extremists, aim to do).

In other words, according to this line of thinking, *culture creates and controls people*.

The evidence paints a far different picture. All culture, including music, is biological in origin because culture originates, ultimately, in human brains, and manifests amazing similarity worldwide. What we humans think, what we know, and how we behave comes *partly* from our genetic inheritance, and *partly* from what we learn (using our brains) from the people we personally associate with, and the cultural artifacts we come in contact with, such as the television we watch and the music we listen to.

Our genes do not *control* us. But the culture around us does not control us, either. No amount of social engineering can change that. As the American biologist E. O. Wilson aptly put it in his Pulitzer Prize winning book, *On Human Nature*, "The genes hold culture on a leash."

We humans use our brains to create new, original culture all the time. But it's rarely so new and so original that it has nothing to do with our genetic

predispositions, notwithstanding the efforts of postmodern artists, including musicians.

1.3.23 INHUMAN MUSIC OF THE BIOLOGICALLY UNINFORMED: POSTMODERNISM

It's one thing to create original art. It's another to create *inhuman* original art.

Artistic movements such as postmodernism in music and other arts represent brave attempts by artists to break free of our evolved human nature.

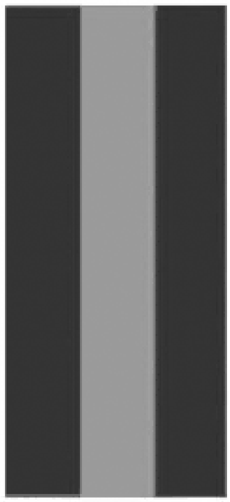
It doesn't work.

Human brains evolve with glacial slowness. Biologically, we humans still have brains adapted to Stone Age conditions, like it or not. Humans have been hunter-gatherers for more than 99 percent of human history. No amount of enculturation can change that.

Most people don't hang postmodern canvasses of meaningless stripes and blobs on their walls—unless under peer pressure. Nor do they read disjointed gibberish. Nor do they listen to atonal ("serial") music.

Cultural relativists insist all art is equal. No such thing as "good" art or "bad" art. A Sunday painter's crude rendering of Elvis has just as much aesthetic value as a Monet.

Consider these two paintings. One is Jan Vermeer's "The Music Lesson." The other is Barnett Newman's "Voice of Fire."



The Vermeer speaks for itself. As for "Voice of Fire"—it's exactly what you see: three vertical stripes, a work of "art" devoid of a scintilla of imagination or skill. The National Gallery in Ottawa, Canada authorized the payment of $1.76 *million* for "Voice of Fire." Cultural relativists deemed it a bargain.

If you criticize the spending of that amount of money on a panel consisting of three stripes—the type of design you would see at a shopping mall food court—you're obviously some narrow-minded Philistine, judging something of which you have no cultural knowledge, something that's out of your cultural experience. "Voice of Fire" is a genuine *Barnett Newman*, after all. A national art gallery paid $1.76 *million* for it, so it must be worth the money. Hey, for that kind of money, it has to be a masterpiece!

The emperor has no clothes. If no one knew it was a *genuine Barnett Newman*, "Voice of Fire" might fetch as much as $10 at a yard sale—the value of the canvas or plywood or whatever it's painted on (the thing is pretty big).

It's unlikely anyone in their right mind would hang a poster-size reproduction of "Voice of Fire" on their wall. But lots of people hang reproductions of "The Music Lesson."

From a commercial standpoint, the National Gallery in Ottawa has probably recouped its financial investment in "Voice of Fire" from the admission fees of incredulous visitors who just had to find out for themselves if the gallery actually did purchase a panel painted with three stripes for $1.76 million, and did provide wall space for it, instead of a work of art.

As for music ... a cultural relativist would insist that you have to consider a musical piece within its cultural milieu, so all music is equally valid. There's no such thing as a "good" song or a "bad" song. Artistic merit is too subjective to be judged or measured. A 12-year-old's first attempt at songwriting has just as much artistic merit as "Georgia On My Mind."

This kind of thinking is utterly delusional because it ignores or denies the reality of evolved human nature.

POSTMODERN ANIMAL ART, POSTMODERN CHILD ART, POSTMODERN *SCIENCE!*

If you saw a chimpanzee-painted picture, you probably wouldn't pay $5 for it—*unless* you knew that a chimp painted the picture. In that case, you might pay lots of money for it. The "art" of Congo the chimpanzee (1954 - 1964) has sold for tens of thousands of dollars.

Similarly, four-year-old Marla Olmstead's postmodern paintings ("abstract art"), indistinguishable from postmodern paintings in

New York's finest galleries of indistinguishable postmodern paintings, have sold for thousands of dollars each.

Postmodern artists get much attention in the media ... but what about postmodern socio-political critics and cultural analysts? Doesn't their gibberish deserve more attention, too?

Alan Sokal, a New York University physicist thought so.

Fed up with denials of reality and the downplaying of scientific evidence by postmodern intellectuals insistent on promulgating claptrap about the "social construction of reality," Sokal decided to try a little experiment to determine whether or not postmodern relativists had any ability to recognize pure, unadulterated bullshit when it hit them in the face.

Sokal wrote an article titled, "Transgressing the boundaries: Towards a transformative hermeneutics of quantum gravity." He submitted it to the well-known postmodern cultural studies journal, *Social Text.* The 35-page article was a hoax, full of wooly postmodern jargon and scientific-sounding absurdities about the implications of quantum physics on social culture, and the role of postmodern science. The bafflegab and the scientific credibility of the author impressed the editors of *Social Text.* They did not bother to have the article reviewed by scientists who would have known immediately that it was ludicrous twaddle from beginning to end. Instead, *Social Text* published the article—even though they could not possibly have had any understanding of it, since it was meaningless.

Musicians unaware of evolutionary biology and its implications often create incomprehensible, inhuman music in an attempt to come up with something original—musical equivalents of "Voice of Fire" or chimpanzee art or Marla Olmstead's "abstract" paintings. "Surely," the argument goes, "it's time to move on from tonal music. We have to progress!"—without realizing that the notion of progress does not apply to the arts, including music (more on this in Chapter 2).

A postmodern chef would presumably create bold new original dishes by incorporating ingredients such as coal dust, Styrofoam, and plutonium. Not many humans eat inhuman food. And not many humans appreciate inhuman music and inhuman visual art. (Some do, though ...)

If you write and perform "postmodern" songs, you will probably have a problem making a living. Inhuman music means *inaccessible* music. Inaccessible music does not communicate emotionally (except to irritate the listener) because the human brain cannot find meaning in it on any level. It's not because listeners aren't

sophisticated enough. It's because the music itself amounts to pretentious, meaningless rubbish.

1.3.24 MUSICAL UNIVERSALS

Similar musical elements show up to some degree in the music of all cultures. For example, Westerners listening to Hindustani music report feeling the same specific emotions as the emotions Hindustani musicians report they are intending to convey. Similarly, young children specify the same emotions elicited by a piece of music as do adults. If you could time-travel, you would find the same musical universals in the music of cultures that went extinct tens of thousands of years ago.

Today, music likely tops the list of all the artistic activities humans practise globally. Here are some musical universals (Table 3)—musical traits found in all musical cultures worldwide (not necessarily characteristic of every *individual*, but in pretty much all cultures):

TABLE 3 Some Musical Universals

Cadence	Music used in ritual or religious practice
Children's music as its own genre	Music used to mark important events
Dancing to musical accompaniment	Musical instruments
Emotions aroused by the same musical information are the same emotions (i.e., not dependent on previous exposure or knowledge of the music being played)	Phrase as the basic unit of musical structure
Harmonic sensing automatic (i.e., ability to sense a note and relate it harmonically to other notes)	Resources and time dedicated to music are substantial (applies as much to industrial societies as to hunter-gatherer societies)
Infants' ability to discriminate differences in pitch and timing	Rhythm based on isometric beats
Intervals with small-integer frequency ratios, such as octaves, fifths, and fourths	Rhythmic pulse groupings of 2 or 3 beats
Melody, and grouping of melodic notes into sequences	Scales of 7 or fewer different pitches to the octave
Music considered as art	Scales with unequal steps, such as the pentatonic scale
Music listening involves rhythmic bodily movement (entrainment)	Song classification/categorization
Music not a rare talent	Songs with short repetitive phrases within a range of a perfect fifth
	Symmetry in musical structure/form
	Vocal music, practised by both men and women

1.3.25
HOW MUCH OF MUSIC IS INNATE, HOW MUCH IS CULTURALLY ACQUIRED?

You owe your ability to appreciate and create music to the genes you inherited from your parents and their ancestors, going back many thousands of generations. But the *specifics* of your musical tastes and musical creativity come primarily from the cultural preferences of your *peer group*—not from your parents. This applies to your non-musical cultural preferences as well.

Imagine this sequence of events.

- You are born in a small village in South Korea. As a child, you become fluent in the Korean language, absorb the Korean folk music traditions of your parents, and observe their Buddhist religious practices.

- When you are six years old, your family emigrates to America and settles in Dodge City, Kansas. Your parents learn practically no English, retain their strong Buddhist faith, and socialize only with other Koreans in Dodge City's small Korean neighbourhood. At home, you and your parents converse exclusively in Korean.

Fast forward a few years.

- Now you are 11 years old. You've been going to school in Dodge for five years. Your parents can still hardly speak a word of English, still hang around with their Korean friends, and remain firm Buddhists.

  As for you...

- You now speak fluent English with an accent indistinguishable from the accent of your native-born American posse in Dodge. You also dress like them, swagger around like them, ride horses like them, and have habits and tastes and religious interests like theirs.

- You walk and talk and identify with your Dodge peer group—not your parents and the Korean world they still inhabit.

- In short, you inhabit a personal environment of your own, an environment that overlaps with the personal environments of your peer group. It shows. You still have the genetic inheritance of your parents, of course, but the specific cultural information you have acquired has come mainly from your

peer group. And that includes not just your language, but also your musical tastes.

How much of is music innate, and how much is culturally acquired? Probably something like half and half. But you can't disentangle genetically inherited influence from culturally acquired influence because musical universals show up in varying degrees in the music of all cultures.

1.3.26 WHERE IS MUSIC? WOVEN IN THE FABRIC OF LIFE GLOBALLY

Most people experience music every day. One study revealed a 44% probability of experiencing music in any two-hour period.

This doesn't mean that people are actually paying attention to the music they hear. That doesn't happen much. Music hangs around in the social environment.

- People often focus on music as a diversion when doing mundane work or chores.

- People also listen to music to regulate their own mood—to get out of a bad mood, get into a romantic mood, get into an excited mood.

According to one study, adolescent girls tend to use music as a mood regulator. Boys use music to make an impression on others. Boys also like to listen to music when alone, assimilating identity-building cultural stereotypes.

Music weaves its way through the fabric of everyday life everywhere: waking up, getting ready for work or school, eating, working, travelling, playing, courting, meditating, praying, horse grooming, shopping, exercising, socializing, trying to get to sleep.

WHERE? WHAT ABOUT OUTSIDE THE BRAIN?

Music originates solely in the brain.

Or does it?

Could global consciousness, or mass consciousness generally, influence music-making? Is there such a thing as global consciousness?

In 1998, researchers at Princeton University set up an international global consciousness monitoring system. They began placing dozens of electronic random event generators (REGs) in many countries around the world. These devices continue to generate sequential data completely at random. The REGs are independent of one another, so they cannot influence each other. Each REG periodically uploads its random data to the lab at Princeton.

The purpose of the experiment was (and still is) to test the following hypothesis:

> *The composite variation of the distribution means of data sequences (segments) recorded from multiple REGs during broadly engaging global events will deviate from expectation.*

In other words, if global consciousness exists, and if it's detectable with existing technology, then it should affect REG-generated data during events where large numbers of people are thinking about the same thing at the same time. Examples of events would include:

- A major terrorist attack such as 9/11
- An election
- A natural disaster such as a major earthquake or hurricane
- A mass-media event such as an international fundraising musical extravaganza

When comparing the data from one REG with the data from another, you would expect to find no statistical correlations beyond what would be expected by chance, if human thinking did not influence the electronically-generated data from the REGs.

But the results of the Princeton experiment, which have been reported continuously since 1998, show numerous statistically significant REG data correlations associated with major humanly important events. The closer the event is physically located to a REG, the greater the effect on the REG data.

While the results neither "prove" nor "disprove" specific cause-and-effect claims, they do provide solid evidence supporting the hypothesis of the investigators.

The scientific rigour with which the monitoring and reporting system was established, and the results it has produced, make the Princeton experiment one of the most fascinating ever devised. You can find out about it and have a look at the results

to date (and even the raw data) at their website: http://Noosphere.Princeton.edu/.

1.4 When Did Music Get Started?

1.4.1 THE "WHEN" QUESTION: SCIENCE VS RELIGION

> Science shares with religion the claim that it answers deep questions about origins, the nature of life, and the cosmos. But there the resemblance ends. Scientific beliefs are supported by evidence, and they get results. Myths and faiths are not and do not.
>
> —RICHARD DAWKINS, eminent British zoologist

> Why is there something instead of nothing?
>
> —HANS KUNG, eminent Swiss theologian

Empirical evidence indicates Darwinian evolution created in you and in all other humans an adaptation for music in the form of an integrated network of brain modules (neuronal circuits) that enable you to make music and respond emotionally to music.

According to certain religious doctrines, talk of Darwinian evolution amounts to nonsense or even blasphemy: God made man, and God bestows the gift of music as God sees fit. (Or, certain specific gods, depending upon the religion.)

Science has succeeded spectacularly in explaining nature and making factual information available for the creation of incredible technologies, from flying machines to nuclear weapons to life-saving medicines to guitars and pianos. Science keeps us atop the food chain and able to protect ourselves (most of the time) from the most lethal of natural non-human predators.

Most religions hypothesize (but promulgate as truth) divine creation, external, objectifiable forces of good and evil, an afterlife, and some sort of heaven and hell.

But sincere belief in religious doctrine does not make it true.

The evidence supporting Darwinian evolution directly contradicts such claims, earning the enduring hostility of strongly committed religious adherents who believe

in the unchangeable doctrines and "received truths" of their faith, and do not tolerate free inquiry, evidence, or critical thinking.

In one notorious case in America in the 1920s, a high school science teacher stood trial for teaching evolution, in violation of Tennessee law. The court convicted him (Scopes Monkey Trial). Some U. S. states still occasionally pass anti-evolution statutes, though courts now tend to pay more attention to the constitutional principle of separation of church and state.

RELIGION AS AN ADAPTATION

But that the dread of something after death,
The undiscover'd country from whose bourn
No traveller returns, puzzles the will
And makes us rather bear those ills we have
Than fly to others that we know not of?
—SHAKESPEARE (*Hamlet,* III, I)

Religion may actually be a behavioural adaptation. Religious beliefs are hypotheses that try to explain things people can't understand or figure out, for lack of information or evidence, "attempts of the human mind to impose some kind of order on the chaos of existence."

No credible evidence exists that any species, including *Homo sapiens*, has a higher purpose beyond survival and procreation—i.e., sending genes into the next generation. If, as biological evidence suggests, religious faith is a biological adaptation, the selective pressure that created it has some obvious functions. Religious faith...

- Helps protect adherents (the overwhelming majority of humankind) from depression, anxiety, and suicide—although some adherents use suicide as a ticket to "paradise," such as the 9/11 terrorists and countless suicide bombers.

- Provides a sense of well-being by"answering" profound questions. The human species made it to the top of the food chain by understanding cause-and-effect. Where no cause-and-effect evidence exists, religious faith stands in. Believers report higher levels of happiness and life satisfaction, compared with non-religious peers.

- Provides adherents with membership in a powerful group, and all the survival advantages that go with such affiliation.

The hypothesis that religion is an adaptation would predict that religious faith would be prevalent in all societies, regardless of level of technological advancement, in nations such as India as well as in nations such as America.

Religions compete with each other much as businesses compete with each other for mind share and market share. Winning religions flourish and spread through proselytizing and warfare, then die away and become mythologies (e.g., Roman and Greek religions are now considered mythologies). A mythology, it is said, is a religion that has gone out of fashion. Odds are, in the unlikely event humankind does not fight or poison itself into extinction over the next few centuries or millennia, today's religions will pass into official mythology. New religions will prevail, deifying Captain Kirk, Harry Potter, and Paris Hilton. (Perhaps the Hilton hotel in Paris will assume the religious significance now associated with the Vatican.)

Religion has been around for tens of thousands of years—far longer than any of today's Johnny-come-lately religions such as Judaism, Hinduism, Buddhism, Christianity, and Islam (and secular religions such as Marxism and Naziism). And much longer than any of recorded history's extinct religions. According to one anthropological estimate, humankind has created perhaps 100,000 religions over tens of thousands of years. A 35,000-year-old cave painting in Italy, for example, clearly shows a mask-wearing shaman or wizard, hands outstretched, likely performing some sort of ritual. As well, there is evidence that the species *Homo neanderthalensis*, a species distinctly different from our own, had religion some 60,000 years ago.

As for brain location of the "religion" adaptation, damage to the right frontal lobe significantly alters a person's religious and political beliefs and values. Who knows, perhaps a little poking around in the right frontal lobe would transform Pat Robertson from an intemperate Christian fundamentalist into an intemperate Islamic fundamentalist.

1.4.2 Religious and Political Assaults on Music

From time to time throughout history, religious and political leaders, recognizing the power of music to engage people emotionally, have sought to quash it, sometimes brutally.

A few examples:

- The Christian church obstructed the development of polyphony and harmony because religious leaders realized music elicits emotion, including *pleasure*, which was contrary to church doctrine.

- The Nazis banned jazz in the 1930s because black people played it and Jewish people encouraged and financed its development.

- The communist Chinese dictatorship, when it seized power in1949, banned jazz, the music of the bourgeois capitalist West.

- Various American churches with white congregations and racist agendas have periodically banned specific types of "immoral" African American music, sometimes targeting particular performers.

- In Afghanistan in 1996, the Taliban seized power and imposed a hideous form of religious fascism on the country. For the next five years, the Taliban's Islamic police force visited incredible horrors and atrocities on various sectors of the population, especially women. The Taliban banned education for girls, blew up works of art, and outlawed music. Playing or enjoying music was deemed "un-Islamic." Musicians resisted by going underground and continuing to make music.

- In Algeria in the 1990s, Islamic death squads specifically targeted, hunted down, and murdered musicians for their "un-Islamic" musical activities.

1.4.3 ULTIMATE ORIGIN OF THE ADAPTATION FOR MUSIC: COMMON DESCENT

DNA and palaeontological evidence indicates all life on earth began from one replicating molecule nearly four billion years ago. Every living thing on earth uses the same 64-word DNA "dictionary" of codons, practically conclusive evidence that all life on earth descended from the same molecular ancestor. This phenomenon is known as *common descent*. The origin of life amounted to the origin of heredity.

Today, for example, humans and flies share much of the same genetic material. So do humans and mice. As previously mentioned, humans, bonobos, and chimpanzees share more than 98% of the same DNA. The genomes of chimpanzees and humans have been sequenced and compared, and show remarkable similarity.

Humans share some similar behaviour characteristics with chimpanzees, such as male aggression and tool use. Yet, despite genomic similarity, enough genetic differences exist to make humans and chimps far different species.

EVOLUTION IS "JUST A HYPOTHESIS"? RUBBISH

> *Evolution is a bankrupt speculative philosophy, not a scientific fact. Only a spiritually bankrupt society could ever believe it. ...Only atheists could accept this Satanic theory.*
> *— JIMMY SWAGGART, American fundamentalist preacher*

Science admits and encourages criticism and testing, making it essentially self-correcting. Scientists do not consider anything as absolutely true for all time. Religionists and political ideologues do.

Scientists consider well-supported hypotheses, usually called *theories*, to be as factual as you can get without resorting to religion-like proclamations of absolute truth. Newton's theory of gravitation applies on a scale humans can relate to, but Einstein's theory applies on a cosmic scale. As for evolution, the evidence for its reality is massive. James D. Watson, American biologist, co-discoverer of the structure of DNA, and Nobel prize winner, puts it this way:

> *Today, evolution is an accepted fact for everyone but a fundamentalist minority, whose objections are based not on reasoning but on doctrinaire adherence to religious principles.*

Mr. Swaggart apparently does not agree with most Christians of the major denominations, who, in the face of overwhelming evidence, accept the reality of evolution without abandoning their faith. Some 18 years after his election, even Pope John Paul II finally allowed as how...

> *fresh knowledge leads to the recognition of the theory of evolution as more than just a hypothesis.*

Perhaps the Pope was mindful of the actions of one of his predecessors, the "infallible" Pope Urban VIII, who sentenced Galileo to a life of house arrest for daring to agree with

Copernicus that the earth is not the centre of the universe, and in fact all the planets, including the earth, revolve around the sun.

From the moment Darwin published his theory in 1859, religious adherents have opposed it because, in their minds, evolution "dethrones God." For some 70 or 80 years after Darwin's theory was published, most people—even biologists—refused, on various religious and moral grounds, to consider that Darwinian natural selection might be right. Philosophers held out even longer, until the middle of the 20th Century.

Research on human mindset indicates humans hold on to core political and religious beliefs even in the face of compelling, contra-indicating factual evidence because they don't want to have to cope with the emotional stress involved in modifying beliefs.

Those who simply do not wish to believe scientific evidence that conflicts with strongly held religious faith try to discredit evolutionary theory ("shoot the messenger").

It's interesting to note that more than 80% of U. S. teenagers believe God created human beings, either directly, by creating us in our present form *within the last 10,000 years*, or indirectly by guiding the evolutionary process so that we would end up the way we are. Only 20% of adults with a high school education or less believe that Darwinian evolution is a well-supported scientific theory. The remaining 80% presumably believe evolution is "just a hypothesis." Education tends to dispel belief in creation mythology. The proportion of believers in creation mythology plummets to 35% among adults with a post-graduate education. But that still means 35% of adults with a post-graduated education refuse to believe the scientific evidence supporting Darwinian evolution.

The first replicating molecule originated in one of two ways:

1. ***In situ* hypothesis.** Until recently, pre-biotic chemists believed life originated in the chemical cauldron that was the earth's surface several billion years ago.

2. **Panspermia hypothesis.** Today, in light of new evidence, the *panspermia* hypothesis seems more likely. Life may not have had an earthly origin. On more than one occasion, astronomers have observed "sugar clouds" floating around in the Milky Way—some of the same organic material contained in comets that smash into the earth every so often (not too often!). If this is how

life on earth got kick started nearly 4 billion years ago, it probably happened on countless other planets in our galaxy and other galaxies.

How did non-life turn into life?

In popular mythology, life begins with "ensoulment," which occurs at the "moment of conception." In fact, there's no such thing as a moment of conception. The biological process of conception takes up to 48 hours to complete. Similarly, no sharp demarcation exists between non-life and life. Viruses, for example, have either DNA or RNA, but are not considered to be "alive" until they infect host cells, where they replicate and behave like life forms, sort of.

Scientists can create organic compounds in the lab, including some of the life-essential amino acids, by simulating conditions on earth billions of years ago. Two-carbon sugar, such as the sugar in the observed galactic sugar clouds, is not far removed from RNA. In the presence of minerals such as borax, simple sugars stop reacting at five carbons, the carbon sugars of life. Not only that, a form of evolution by natural selection (but not life) was set in motion in the lab in some remarkable experiments by the molecular biologist Sol Spiegelman.

DNA replication, like the generation of sentences and musical phrases, is combinatorial. A finite number of genes creates a practically infinite number of combinations. That's why the absolute number of genes in the genome of a given species has practically nothing to do with the complexity of the organism. Humans have only about 25,000 to 30,000 genes. Other species have more.

However, scientists will never be able to artificially create life as we know it in a lab, for several good reasons:

- The first life on earth evolved without oxygen. Even today, living organisms at the bottom of the ocean surrounding undersea vents metabolize sulphur instead of oxygen.

- DNA almost certainly had a replicating forerunner, long extinct.

- Life today consists of cells, which are extremely complex, exquisitely functioning units that took billions of years to evolve from scratch. They contain many thousands of molecules and ions. No one is going to artificially create a living cell in the lab from scratch anytime soon.

"SUPER BOWL" JANET, APPEARING AT YOUR LOCAL MADRASAH

One day, millions of atoms that now constitute Janet Jackson's naked right "Super Bowl" breast will mingle merrily with atoms

of the eyeballs of fanatical fundamentalists, ensconced in their madrasahs.

After you die, your body's trillions of atoms slowly but surely make their way back into the atmosphere, and way beyond. Nature recycles atoms.

Right now, you probably have, built into our own body, millions of atoms of Plato, Cleopatra, Helen of Troy, and Guido d'Arezzo. And anyone else you care to name who lived many centuries ago.

And, in the future, your atoms will frolic with the atoms of Judy Garland, Janet Jackson, Elvis (if he ever dies), Salman Rushdie, and every sanctimonious mullah who ever issued a fatwa.

1.4.4 TIMELINE OF MUSICAL EVOLUTION

Here are some significant points in evolutionary history, focussing on events of musical significance (all dates approximate, of course).

- **3.8 to 3.9 billion years ago:** The original replicator starts replicating.

- **500 million years ago:** Life forms begin to sense sound.

- **5 to 7 million years ago:** Hominid line splits from other primates. Last common ancestor of chimpanzees and humans probably lived about 7 million years ago.

  Oldest known hominid could be *Sahelanthropus tchandensis*, about 6 million years old. Or it could be *Ardipthecus kadabba*, also about 6 million years old. Or some other two-legged critter with a fancy Latin name.

  Hominids arose in Africa. Key characteristic of hominids is that all were bipedal—the first significant trait that separated early hominids from great ape species. This led to rearrangement of internal organs now characteristic of modern humans, the only hominid species that has not (yet) gone extinct.

  Due to bipedalism, humans have a unique respiratory tract, compared with our non-bipedal close relatives such as chimpanzees and gorillas. Humans

have better control of breathing, and this probably facilitated the evolution of language and vocal music.

Proto-music and language may have begun soon after the hominid branch split from the common ancestor of humans and today's great apes. However, bipedalism did not lead directly to encephalation (brain expansion). Hominids were walking upright for several million years before encephalation began.

For the first 5 million years of hominid evolution, the dominant species were various runty little Australopithecines ("austral" means "southern," as in southern Africa; nothing to do with Australia).

- **2.4 million years ago:** The genus *Homo* appears. That's our genus. About a dozen *Homo* species eventually evolved, all of which became extinct except *H. sapiens*.

  Most human evolution took place in the Palaeolithic Age, also known as the Old Stone Age, a time period recognized by palaeontologists and archaeologists that began about 2.5 million years ago and ended about 12,000 years ago. (In geology, the equivalent period is called the Pleistocene epoch—1.8 million years ago to about 12,000 years ago.)

  It is possible that music has existed in all species of the genus *Homo*. However, it's hard to know exactly when music began because musical instruments made of reeds or trees or animal hides decay into dust and leave no fossil evidence. Also, the vocal apparatus is made of soft tissue, which decays into dust, except for the hyoid bone, which occasionally fossilizes.

  Evidence from the fossil record indicates a modern respiratory system in the genus *Homo* at least 1.5 million years ago, with traits such as a barrel chest and projecting nose—requirements for producing both vocal music and words. So it's conceivable that singing and language go back that far. Apes, due to their vocal tract anatomy, do not have the ability to produce consonants, and, therefore, spoken language.

- **2.4 million years ago:** MYH16 mutation in genus *Homo* that may have enabled encephalation.

- **2 million years ago:** Evidence of encephalation already underway in genus *Homo*. Skull size eventually triples to present-day size.

  Selective pressure drove the evolution of a variety of social bonding adaptations, including music and language, and thereby drove encephalation.

Although a few animals have brains that exceed the size of the human brain, the important thing is the ratio of brain size to body weight. By this measure, *Homo sapiens* easily tops the podium as the brainiest species on the planet.

The American palaeontologist Stephen Jay Gould, among others, studied the ratio of brain size to body weight in other hominids and other primates, and concluded, "...our brain has undergone a true increase in size not related to the demands of our larger body. We are, indeed, smarter than we were."

- **800,000 to 1 million years ago:** Evidence from archaeology that hominids controlled fire. A milestone in music: the first campfire songs!

- **200,000 years ago:** Early modern *Homo sapiens* appears.

- **200,000 years ago:** Unfairly maligned *Homo neanderthalensis* appears. Became extinct approximately 30,000 years ago.

  H. neanderthalensis was a hardy, intelligent species distinct from *H. sapiens*, and with a *larger brain*. DNA evidence shows *Homo sapiens* did not "descend" from Neanderthals, nor interbreed with Neanderthals.

  A Neanderthal hyoid bone—the horseshoe-shaped bone above the larynx—from about 45,000 years ago has pretty much the same shape as a modern human hyoid bone. Neanderthals also had other cranial characteristics required for vocal music and speech, which fall well within the human range. Neanderthals probably spoke and sang and had similar mental abilities as *H. sapiens*.

  It is entirely possible that our species, *H. sapiens*, killed off *H. neanderthalensis*. Early genocide.

- **115,000 years ago:** Fully modern *Homo sapiens* (Africa).

- **60,000 to 100,000 years ago:** A relatively small number of modern humans leaves Africa. DNA and other evidence strongly indicates all humans today are descended from this small group.

  Since they were biologically the same as us, they must have had language. And since music either preceded or co-evolved with language, they must have had music.

- **75,000 years ago:** Evidence of human use of symbolism (Africa), the hallmark of human culture. Humans were using beads made from shells, not merely for decoration, but to communicate meaning.

- **44,000 years ago:** Oldest known well-documented musical instrument, a bone flute. This means it's likely people commonly made flutes from other materials such as hollowed-out plant stems. (Cultures already had highly developed visual art by this time.)

  The fossil record shows *Homo neanderthalensis* made this bone flute—not *Homo sapiens*. As a musical instrument, the Neanderthal bone flute is sophisticated and not obvious. (Other inventions that seem simple and obvious, such as the wheel, only arose in the past few thousand years.)

  The Neanderthal bone flute has four holes spaced such that the sound corresponds to whole and half-steps of the diatonic scale.

  Percussion instruments likely predated melodic instruments by hundreds of thousands of years. Human vocal music certainly predated music played on percussion instruments.

- **32,000 years ago:** Symbolic markings on bone, clay, stones, and ornaments reveal that elementary literacy is well in place by this time.

MUSIC NOTATION: THE "FROZEN ARTIFACT OF THE SCORE"

Music without notation, like language without writing, goes back hundreds of thousands of years.

The technologies of notating music and language are relatively recent non-instinctive cultural constructs, invented in the past few thousand years. Being non-instinctive inventions, written language and music require specific schooling to master.

A piece of notated music, like an architect's drawing, amounts to a technical, symbolic representation of the real thing.

When you play or sing a piece of music from notation, the "frozen artifact of the score," what you play never corresponds *exactly* to the notation. A computer can do that, you can't. The difference between what's notated on the page and what you

actually sing or play constitutes your personal style (not counting unintended errors).

When you notate music, you code sound, which gets decoded during performance. At the same time, the brains of listeners re-code the sound, thereby experiencing music.

A lot of music teaching obsesses on the technical "coding-decoding" aspects of music. And especially on eliminating "errors." Playing each note absolutely "correctly." Exactly as notated. Never mind emotional substance and content. Many students who take years of conservatory lessons can sight read the most complex classical pieces, yet have no real understanding of how music works, and could not play a Hank Williams song without the sheet music.

Notating music used to be the only way to make a permanent record of a song or other piece of music. If you were a songwriter and did not know how to notate, you had to either learn how, or find someone to do it for you.

When personal recording technology came along, you could create a permanent record of a song without having to learn music notation.

Now, with digital technology, you can use any number of hardware and software products to turn the music you play into musical notation—for the benefit of musicians who don't know how to play by ear.

It's the age of post-literate musicianship. If you own a computer and have the right software, you can create elaborate music without ever having to learn to play a musical instrument.

1.4.5 DID MUSIC AND LANGUAGE CO-EVOLVE? SIMILARITIES BETWEEN MUSIC AND LANGUAGE

Darwin believed language and music had a common origin in sexually selected mating calls, but that language developed first. However, today researchers believe the preponderance of evidence indicates language and music co-evolved from a common vocal ancestor adaptation.

Evidence indicates early hominid species could dance and sing several hundred thousand years before the appearance of modern *Homo* species. Music, language, and dance may have a common origin in the modules that evolved for pounding, throwing, and tool-using generally. The underlying skill manifesting as an adaptation would have been rhythm.

Language syntax (order or arrangement) and musical syntax appear to share common processes in the brain. Studies of brain activity during music and language processing show similarities in the way the brain handles temporal (time-related) aspects of both language and music. "When we listen to language and music, not only do we expect words or chords with specific meaning and function, but we also expect them to be presented on time!" For hilarious confirmation, track down Bob and Ray's comedy sketch, "Slow Talkers of America."

Music could have evolved from speech, or speech from music, or, more likely, both speech and music could have co-evolved, sharing a common ancestor that had some characteristics of speech, some of music. In early humans, the music-language precursor, termed "musilanguage" by the neuroscientist Steven Brown, would have conveyed referential meaning (i.e., information) and also emotional meaning, using discrete pitch levels and expressive phrasing. Eventually, the musilanguage precursor would have split into two specialties:

- A specialty for conveying mainly referential meaning symbolically, (language), initially by expressive phrasing, and later using a vocabulary of words

- A specialty for conveying emotional meaning, mainly without symbolic meaning (music), via discrete pitch levels

Music and language likely co-evolved, and therefore interacted. So crossover occurred, as evidenced in songs with lyrics—"verbal song." Today, there's a continuum:

Pure speech	Expressive speech	Rhythmic poetry (including rap)	Melody with lyrics	Non-verbal vocal music (e. g., scat singing)	Pure instru-mental music

Music and language both evolved as systems to communicate meaning via sound organized in the dimension of time. They have in common:

- Metrical structure: strong and weak beats
- Melodic contour: rising and falling pitch
- Group structure: phrases within phrases
- Phrase duration

- Communication of emotion (although music dominates)

However there are some clear and important differences between music and language:

- Language conveys information as well as emotion. Music communicates emotion only.

- Everybody can easily create language competently (talk meaningfully), whereas not everybody can create music competently. It may well be that this difference stems from the fact that everybody gets constant practice in language in everyday communication, whereas, after infancy and after learning to talk, musical communication as a survival necessity falls off dramatically, and therefore into disuse.

- Language does not have an equivalent of the musical phenomenon of harmony. In harmony, two separate pitches are produced at the same time and the brain makes sense of the resulting sound. However, in speech, two separate words produced at the same time sound garbled. The brain cannot make sense of the resulting sound.

Overall, the similarities between music and language in the brain are striking, and outweigh the differences, indicating a common origin.

1.4.6
DID MUSIC AND LANGUAGE CO-EVOLVE? EVIDENCE FROM STUDIES OF ANIMALS

Both music and language have extremely similar phrase-based hierarchical structures and other similarities—so many that it's highly unlikely they did not co-evolve.

The evidence indicates primate singing evolved several times independently (a phenomenon called *convergence*) from adaptive calls originally used to signal alarm or to advertise territorial claims. Ultimately, such calls evolved into music and language in various species of the *Homo* genus.

In today's great apes, for example, hoots and calls transmit information among groups about where individuals and sub-groups are hanging out, who's looking for a mate, and what the neighbourhood primatologists are up to. Physical movements such as stomping and shaking branches often accompany vocalizations. In our hominid ancestors, such actions may well have evolved into rhythmic motion, reinforcing vocal calls.

Primates other than humans have vocal communication systems that fit the description of the musilanguage precursor. For example:

- Both gibbons and chimpanzees make vocalizations that biologists consider to be "protomusical," that is, ancestral or early stage, the kind of vocalizations that our hominid ancestors probably made before their brains enlarged and human-like music and language became possible.

- Vocalizations of East African vervet monkeys convey both emotion and referential meaning.

- Mated pairs of gibbons "sing" duets.

To summarize, language requires a large brain, as does rhythmic, scale-based, harmonic human music. No other species has a brain-to-body-weight ratio as high as humans, and no other species has either music or language. With so much in common, it's likely music and language co-evolved from precursor animal calls.

1.4.7 DID MUSIC AND LANGUAGE CO-EVOLVE? EVIDENCE FROM STUDIES OF CHILDREN

Competence in both language and music develop in all normal children spontaneously. No conscious effort necessary. No formal training.

Both music and language function in accordance with rule-based brain systems comprised of elemental units (words, pitches, intervals) that group into larger structures (musical and lyrical phrases, sentences, choruses).

Children learn both music and language without any conscious awareness of what they're doing. They effortlessly combine musical elements to create entirely original tunes. With equal ease, they learn words and combine them to create entirely original sentences.

In both cases, they don't realize that they're applying combinatorial rules, already in their brains from birth, to word-vocabularies and pitch-vocabularies.

1.4.8
WHY YOUR "MODERN" BRAIN HASN'T CHANGED IN 50,000 TO 100,000 YEARS

Darwinian evolution happens ssssslllllllllooooooooooowwwwwwwwwlllllllllyyyyyy.

Human brain modules evolved during Palaeolithic times, when our ancestors were hunter-gatherers. Pinker: "The mind is organized into modules or mental organs, each with a specialized design...Their operation was shaped by natural selection to solve the problems of the hunting and gathering life led by our ancestors in most of our evolutionary history." These adaptations still influence our behaviour and often complicate our lives in an increasingly high-tech social environment. We humans disregard our Stone Age genetic inheritance at our peril.

Are humans still evolving by Darwinian natural selection? There is evidence we are:

- One genetic mutation that regulates brain size (MCPH1) arose 37,000 years ago, and has spread "rapidly" (by slow evolutionary standards).

- Another brain-size-regulating gene (ASPM) emerged in its modern form only about 5,800 years ago.

Still, the overall Darwinian evolutionary change in the short term (over the past few tens of thousands of years) cannot be great, because it takes such a long time for an important adaptation to become encoded in the genome of a species.

Suppose you were to jump into a time machine and zip back to the Stone Age. Say, 64,813 years back. You look around and what do you see? Why, a newborn *Homo sapiens* baby. Alas, she's orphaned and wailing, poor dear. You scoop her up, jump back into your time machine, and whip back to the present.

Now what do you do? Contact Marshal McDillon, of course. His cousin's family, the Donkersloots, agree to raise the Stone Age baby.

What's she like anyway, with her 64,813-year-old brain and body?

She's no different from anybody alive today. She looks the same as any newborn in Dodge City. Or even Wichita. As she grows up, she'll learn language normally, play piano, hang around in malls, ride horses, have her pick of ardent male admirers, graduate from university, and become a psychology professor.

Evolutionary lag is the period of time it takes for a mutation in an individual that results in a significant survival or reproductive advantage to become encoded in the human genome. The interval is of the order of several hundred centuries—tens of thousands of years.

On the other hand, the selective pressure of local climatic conditions can bring on less significant adaptations over shorter time periods. For instance, variations in skin color (a topic discussed in Section 1.5).

"INTELLIGENT" DESIGN? RUBBISH

Any sufficiently advanced technology is indistinguishable from magic.
—ARTHUR C. CLARKE

I have...a foreboding of an America in my children's generation, or my grandchildren's generation ... when, clutching our crystals and nervously consulting our horoscopes, our critical faculties in steep decline, unable to distinguish between what's true and what feels good, we slide, almost without noticing, into superstition and darkness.
—CARL SAGAN

It's hard to know where to begin with the notion of "intelligent design" (usually abbreviated *ID*).

ID is a religious creation myth that goes like this: "Wow! How wonderfully complex the living world is! Must be the work of an intelligent designer! Couldn't possibly have occurred by unguided natural selection."

The concept of intelligent design is not remotely scientific. Not a single paper supporting the notion has ever passed peer review for publication in a scientific journal. Like all creation myths, there's simply no evidence for ID, and the hypothesis is untestable. ID is creationist movement funded, especially in the United States, by wealthy conservative Christians.

Use of the word "intelligent" in a term for a creation myth makes ID sound scientific. Strongholds of Christian fundamentalism, including many southern U. S. states, periodically succeed in mandating the teaching of creation mythology (usually dubbed "creation science") in public schools. However, the courts, recognizing the principle of separation of church and state, usually strike down such laws. Religious fundamentalists pull out all stops to out-manoeuver the courts by insisting that ID does not *name* God as the intelligent designer. It just *implies* that God is the intelligent designer. (Perhaps the time has come for Hindus and Buddhists to insist on the teaching of the "science" of reincarnation in the public school system!)

All religions invoke the supernatural without tangible, empirically verifiable evidence, and are hostile to scientific principles that challenge religious doctrine, such as hypothesis testing and critical thinking. Science is about nature and reality, not the supernatural and mythology, so scientific and religious beliefs often conflict.

Far from being "intelligently designed," anatomy reveals how creatures are cobbled together, sometimes even jury-rigged, exactly as predicted by blind Darwinian natural selection. A few examples:

- Humans (and other animals) have more miscarriages than live births.

- The retina of the human eye is "installed" backwards.

- The laryngeal nerve takes a ridiculous roundabout loop to get from the larynx to the brain.

- Human males have nipples.

- In human males, the urethra passes through the prostate. gland—probably the last place an *intelligent* designer would route it.

Humans like to try to solve difficult problems with binary classification. Often, this takes the form of a *false dichotomy:* "If you have no scientific evidence, then God is responsible." (This leaves out the possibility that a scientific explanation does exist, or will one day be found.)

Such is the flawed thinking behind intelligent design. Science does in fact have an extremely well-supported scientific explanation of complex design in nature, namely Darwinian natural selection. Richard Dawkins' *The Blind Watchmaker* is one of many books that spells out the scientific explanation in detail. Darwinian evolution by natural selection gave rise to all life on earth, including the human species. Without foresight, without consciousness, without purpose. And without any need for assistance from a deity or the supernatural.

Natural selection gave rise to the vast complexity and variety of organisms in nature. Richard Dawkins refers to the process of natural selection as the 'blind watchmaker" because cumulative mutations over billions of years lead to vastly complex organisms, creating the *illusion* of design, without nature seeing, hearing, or otherwise "knowing" what's going on.

This applies to humans and especially the human brain. The process seems magical, but it isn't. Darwinian evolution created humans. Advances in knowledge about human biology are replacing notions of a separation of mind and brain.

1.5
Why Is There Such a Thing as Music?

1.5.1
DARWINIAN EVOLUTION AND ADAPTATIONS (INCLUDING MUSIC)

> I don't like nature. It's big plants eating little plants, small fish being eaten by big fish, big animals eating each other ... It's like an enormous restaurant.
>
> —WOODY ALLEN (*Love and Death*)

Many consider Charles Darwin one of the three greatest scientists of all time, in the company of Newton and Einstein. Darwin and Alfred Russell Wallace independently came up with the insight now called Darwinian evolution. Darwin wrote a number of landmark books identifying and describing natural selection, sexual selection, and other aspects of evolution.

Darwinian evolution is the most important theory in all of biology. Voluminous evidence from modern science shows that Darwin got it right, despite having no knowledge of DNA or genes. Darwin discovered that life evolves in distinct lines, with each species on its own individual twig of an ever-widening bush, each species descended from a common ancestor, but destined never to meet. (However, at the bacteria level some evidence indicates "gene-swapping" goes on between unrelated organisms.) Humans did not "descend from apes," and chimpanzees will never evolve into humans.

Darwin came under fierce attack for pointing out (correctly, it turns out) that humankind is merely one of millions of species that evolved from earlier life forms. Moreover, nothing creative or directional goes on in evolution. No ultimate goal

exists in the evolution of any species. *Homo sapiens* does not represent the culmination of anything and is not evolving towards anything.

It's an interesting paradox that humans, with dazzling cognition and insight about everything from Einsteinian relativity to genetics to artistic expression, are clearly unlike any other species on the planet—and yet humans evolved by exactly the same processes as all other species on the planet and carry the same genes as the humblest of them.

Darwinian evolution causes the emergence of adaptations such as bipedalism, music, and language in two ways: natural selection and sexual selection.

1. How Natural Selection Works

All living things compete to survive and pass on their genes. In a given species, each individual differs slightly from all the other individuals. Therefore, in the prevailing environmental conditions, the ability to survive and procreate *varies* from individual to individual. This variability means some individuals thrive better than others under the same environmental conditions. Those that do best—the winners in the evolutionary struggle for resources and opportunities to reproduce—are thus "naturally selected" to pass on their genes to the next generation. Those individuals that do not fare well in the same environment do not pass on their genes.

2. How Sexual Selection Works

Although some species do not reproduce sexually, most do. Members of species that reproduce sexually compete with each other to mate with individuals of the opposite sex. Individuals of both sexes *vary* in their attractiveness and availability as potential mates. This variability means some individuals are more successful than others in mating and procreating, and are thus "sexually selected" to pass on their genes. Those individuals that fail to mate do not pass on their genes.

Woody Allen's observation that the world is an enormous, chaotic restaurant is bang on. All animals, including humans, survive and evolve by eating plants or other animals or both. Species evolve defences to keep from getting eaten. Other species evolve ways to get around those defences, which triggers the evolution of more elaborate defences, and so on—an *evolutionary arms race*. "Nature, red in tooth and claw," as Tennyson put it.

THE NATURALISTIC FALLACY

The naturalistic fallacy goes like this: whatever happens in the natural world, well, that's the way it *ought* to be.

The problem is, it doesn't follow logically that, just because something happens in nature, it's a Good Thing—that its moral value is somehow asserted. Belief that "natural = good" is called the *naturalistic fallacy*. This fallacy led to social Darwinism, discussed earlier.

Nature is utterly mindless and blindly indifferent. Heart defects are natural. So is cancer. So is malaria. Nature is by far the world's greatest bioterrorist.

We humans have "natural" inclinations to lash out violently against those we perceive as doing us harm. Fortunately, humans also have natural propensities for resolving conflict, helping each other, and overriding impulses that could hurt us in the long run. Our evolved moral sense enables us to get along with each other (more or less).

Scientists, lawyers, politicians and others spend their days finding ways to *overcome* or *defeat* the horrors of dog-eat-dog nature:

- Scientists try to come up with vaccines and medicines to counteract the effects of natural pathogens.

- Surgeons try to repair congenital heart problems and any number of other natural conditions.

- Politicians (in theory) pass laws to help us in our struggle to survive and to protect us from our natural impulses to harm or exploit each other; police forces try (in theory) to enforce those laws.

- Teachers pass on information that enables us to acquire what we need to survive.

Humans' evolved empathy and moral sense are adaptations that enable most of us to rise above utterly selfish, brutish behaviour. By behaving humanely, humans *defy* nature.

Non-human animals such as lions, eagles, and bears have no ethical sense, and behave with breathtaking selfishness, callousness, and savagery towards all but their immediate kin.

Normal human behaviour is saintly by comparison. Most people behave "humanely" most of the time, not just towards family and friends, but also towards perfect strangers and animals.

If humans had not evolved an ethical sense, *Homo sapiens* likely would have died out long ago. Constant warfare, natural pathogens, predators and other natural phenomena would have done in the human species by now. (Of course, darker human impulses of those with access to massive technology-based power may one day win out and lead to our quick extinction.)

Humans evolved the ultimate weapon in the evolutionary arms race: intelligence. We have the ability, through language, to share and pool survival-related information and pass it on to future generations through culture. This has allowed humans to get around most defences of most other organisms (although microorganisms still kill millions of our species). We can kill predators such as lions and bears that would easily be able to kill us if we did not have the intelligence to make and use weapons.

For Darwinian evolution by natural selection or sexual selection to proceed, several conditions must obtain:

1. **Selection.** Selective pressure must exist. Species evolve to fit imposed environmental conditions (differential fitness, or survival of the fittest).

2. **Variation.** Genetic variability must exist. Chance mutations and errors in gene replication cause genetic variability to be present among the individuals of a population.

3. **Heredity.** Replication must occur in order to pass on genetic mutations to future generations.

The replicating entities are *genes.* Living things do not replicate. Only their *genes* replicate through their offspring.

Inherited traits that enhance the ability of future replicating entities to replicate are the adaptations. For an adaptation such as music to continue in future generations, it must confer either naturally-selected survival benefits or sexually-selected reproductive benefits (or both). Music probably confers survival benefits in infancy and reproductive benefits later in life.

1.5.2 DAWKINS' "SELFISH GENE": GENE'S-EYE VIEW OF EVOLUTION

> ...the fundamental unit of selection, and therefore of self-interest, is not the species, nor the group, nor even, strictly, the individual. It is the gene, the unit of heredity.
>
> —RICHARD DAWKINS

E. O. Wilson pointed out decades ago that evolution is really all about gene preservation and replication. This "gene's-eye view" of natural and sexual selection is usually referred to as "selfish gene" theory, after the book, *The Selfish Gene*, by the British zoologist, Richard Dawkins. Selfish gene theory has become the dominant framework used in explaining adaptations and adaptive behaviour in evolutionary biology and psychology.

"Selfish gene" metaphorically explains how genes become successful by behaving in a pitiless, "selfish" way. Of course genes don't "think" and "act"—they're blind, deaf, mute chemicals that build living organisms. If the organism dies before the gene it hosts successfully replicates, the gene fails. If the organism lives long enough to replicate, then the gene it hosts succeeds in continuing on to another generation. Genes, then—not bodies—are the actual units of biological selection and replication. The individuals that genes construct (plants, animals, bacteria, etc.) serve only as *vehicles* to pass on genes.

Genes create adaptations—units of biological function that have survival or reproductive benefits for the individual. Adaptations such as music and language actually benefit the gene, because the gene replicates, not the body. In that sense, genes behave "selfishly." But that does not necessarily mean the *organisms* the genes create behave utterly selfishly. It's often to the advantage of genes to select for unselfishness as a behavioural trait in the organisms they build. For example:

- Parents behave *unselfishly* towards their own children, who carry their parents' genes.
- Children benefit from their parents' caring, nurturing, unselfish behaviour by surviving to reproductive age, still carrying their parents' genes.
- Those children pass on their parents' genes to yet another generation.

Organisms eventually die, but the genes they once carried keep replicating. Most humans and all non-human animals have no idea that genes made them, and that if they have offspring, they will have successfully served as vehicles for gene replication. It's important to keep in mind that *genes are not living things*. They are just

strands of DNA—a decidedly non-living molecule. Humans are neither cold, calculating "gene machines" nor "blank slates," programmed by the social environment.

In the discussions coming up about *why* music evolved in humans, keep in mind how adaptations evolve in light of selfish gene theory. *Genes* build adaptations of the body and brain that enable humans to successfully survive, reproduce, and pass on copies of ... *genes*.

1.5.3 HOOTIN' AND HOWLIN' REVISITED: SOUND AS A SIGNALLING DEVICE IN ANIMALS

Why did animals evolve the use of sound in the first place?

As a signalling device for warning and for mate-attraction.

To be a successful adaptation, the signal must not only benefit the individual(s) being signalled; it must also benefit the signaller (selfish genes at work).

- A signal used as a threat warns a competitor to back off, or face a potentially injurious (or lethal) fight.
- A signal use as a warning advises close kin (carrying the signaller's genes) of a nearby predator.
- A contact signal keeps a group together; safety in numbers.
- A courtship signal in humans takes the form of a display of musical ability, signalling mental fitness.

Animals use other signalling devices as well: smell and sight. But sound has several advantages:

- Sound works when the signaller and receiver are far apart, even though they can see each other.
- Sound works when the signaller and receiver cannot see each other because it's too dark or because objects such as bushes or rocks stand between them.
- Sound can carry messages that vary with the signaller's call.

Our *Homo sapiens* ancestors, with incredibly effective sound-based signalling and communication adaptations we call music and language, out-survived all other hominid species. Evolutionary biologists, psychologists, anthropologists, and musicologists have come up with several well-supported hypotheses about selective pressures that gave rise to the human adaptation for music. These explanations do not mutually exclude each other. Following are some of the main ones.

1.5.4 MUSIC AS AN ADAPTATION FOR MOTHER-INFANT COMMUNICATION: WE'RE ALL "PREEMIES" AT BIRTH

Selective pressure for group living favoured a large brain size (encephalation) and also two-legged walking and running (bipedalism). In hominid females, bipedalism narrowed the birth canal substantially. This placed an upper limit on the size of a newborn's head that could squeeze through the birth canal.

It also place an upper limit on gestation length. In the human species, babies are actually born significantly prematurely. We're all "preemies." As a result, at birth, human babies are completely helpless, and remain so for a significant length of time.

Meanwhile, if a pre-lingual human infant has any hope of surviving, it needs some way to continually communicate its many and constant needs with its mother. And the mother needs a way of knowing for certain that she is meeting those needs successfully. Since newborns do not have language, meaningful mother-infant communication must take other forms.

1.5.5 MUSIC AS AN ADAPTATION FOR MOTHER-INFANT COMMUNICATION: "MOTHERESE"

According to the mother-infant communication hypothesis of the distinguished scholar Ellen Dissanayake, selective pressure gave rise to music as a vocal and rhythmic communication and coordination system between mothers and pre-lingual infants. This enabled better maternal care over a longer period of time, and better survival rates of infants into childhood and adulthood.

Pre-lingual infants have and use musical abilities at birth. So do handicapped children and adults born without any capacity to learn language.

Worldwide, mothers vocalize with their infants in a particular, distinctive style called "motherese." Mothers do not learn motherese culturally—they're born with it, evidence that selective pressure evolved the brain circuitry to do this.

Motherese has a number of clearly musical characteristics:

- Melodic (variably pitched)
- Repetitive
- Grouped in phrases of 3 to 4 seconds, like the phrase groupings of poetry and music found in every culture.

As well, mothers communicate with infants via rhythmic, rocking motions, possibly a precursor to dancing. Both vocalization and rocking, rhythmic motions are hallmarks of music as a temporal art.

MYTH OF THE "MOZART EFFECT"

"Listening to Mozart makes you smarter," was the claim. The "Mozart effect" became a fad.

The governors of a couple of American states requested the issuing of Mozart CDs to all new mothers. One entrepreneur cashed in on the craze with a book and series of recordings.

It started in the early 90's when a team of researchers published findings that indicated spatial and temporal abilities improved in subjects after passive exposure to music composed by Mozart. Other researchers could not replicate the findings. Further research found that the so-called Mozart effect had nothing to do with Mozart's music, but could be replicated with any stimulus of the subject's preference (e.g., a narrated story, or some other music).

However, if a child begins *creating and learning* music actively at a young age, the brain responds by allocating more neural matter to musical processing than the child would have if he or she did not actively study and learn music. As well, research indicates that children from inner-city backgrounds who get ongoing, long-term musical instruction through projects such as MusicLink (www.MusicLinkFoundation.org) do much better than their disadvantaged circumstances would otherwise predict.

Initially, an infant, being a preemie, has little capacity to respond to motherese. After a couple of months, the infant begins to vocalize positively, smile, and respond positively to rhythmic interaction. A mother-infant feedback loop of emotional communication develops.

Infant-to-mother emotional communication via musical code sends messages of hunger, frustration, distress. And also positive communication: contentment, happiness. Mothers know how to decode the messages, and also how to communicate back to the infant in the same non-verbal, emotional, musical way. This two-way non-verbal communication strongly reinforces mother-infant bonding.

Neither infant nor mother need to learn how to communicate emotionally with each other using this "musical" system. It's inborn in *both*.

The presence of the infant probably changes the mother's emotional state. Motherese successfully engages the attention of the infant, which begins to respond after several weeks and provides the mother with vital feedback on the infant's survival needs.

Mothers in every culture communicate to their pre-lingual babies in the same specific way: raised pitch level, distinctive pitch contours, repetitive patterns, rhythmic patterns. These elements differ markedly from normal adult-to-adult conversation.

In all cultures:

- Mothers communicate with infants using motherese, and, after a couple of months, infants use the same mechanism to communicate back.
- Infants can mimic their mothers' singing—pitch and melodic contour—early in life, as young as two months of age.
- Infants pay more attention to female vocalizing than to male vocalizing.
- Infants respond more attentively when mothers sing than when mothers speak.
- The lullaby as a mother-to-infant song form takes on the same characteristics.
- Songs for infants and small children constitute a distinct genre of music.

Taken together, all of these characteristics suggest that maternal singing is adaptive. The origin of the music-emotion linkage in adult humans could well be motherese, the music of mother-infant emotional communication of the infant's survival state.

INSTINCTIVE SMILING AND LAUGHING

Babies who are born both deaf and blind begin smiling at the same period of their development as babies born with normal hearing and sight. A blind infant would not smile (make a *facial* signal that communicates happiness or contentment to the mother) if smiling were not inborn.

Later in life humans continue to communicate happiness to others by smiling and laughing. Humans laugh 30 times more often *in the company of other people* than when alone.

Laughter is involuntary, indicating its adaptive nature. And, like other expressions of emotion, laughter is contagious.

In adult humans, competently composed music triggers emotion. Since emotional circuits are essential for survival, people find themselves drawn to music that evokes strong emotions. (Chapter 9 goes into some detail on music and emotion.)

Most songwriters have no clue how to create memorable music because musical notes, unlike the words of a language, have no referential meaning.

Most popular music takes the form of songs *with words* instead of purely instrumental music. It's likely that songwriters, aware to some extent of their inability (due to lack of knowledge) to create emotionally powerful instrumental music, rely on lyrics to help deliver some kind of emotional punch. Songwriters have a better intuitive grasp of the emotional information words carry than they have of the emotional information musical elements such as intervals carry.

1.5.6 MUSIC AS AN ADAPTATION FOR SOCIAL BONDING: SURVIVAL THROUGH COOPERATION

> Music, perhaps, provides a unique mnemonic framework within which humans can express, by the temporal organization of sound and gesture, the structure of their knowledge and of social relations. Songs and rhythmically organized poems and sayings form the major repository of knowledge in non-literate cultures. This seems to be because such organized sequences are much easier to remember than the type of prose which literate societies use in books.
>
> —JOHN SLOBODA

To transfer knowledge across generations, you need human societies. But to get to the point of having human societies, you need group bonding and socialization. That's why music, dance, and language had to predate the formation of cohesive societies, which only emerged in the past few thousand years.

Language and music make it possible for individuals to bond into large, cooperative groups. Extensive research findings strongly indicate music promotes and coordinates group bonding, cooperation, and social cohesion:

- **Everybody's a performer.** In most hunter-gatherer societies, everyone participates in music—no one's an audience member. As well, dancing nearly always accompanies music making.

- **Group emotional arousal.** Music causes a state of general emotional arousal in all the members of a group simultaneously. So music has always served well in situations involving more than one person and ritual: marriages, funerals, groups marching, religious ceremonies.

- **Solidarity through emotional synchrony.** Being able to keep a steady beat and sing to it would increase evolutionary fitness by enabling larger and larger social groups to participate as a single, coordinated entity, increasing solidarity and camaraderie through emotional synchrony. Music has the effect of imposing order and structure on time. At an event featuring music, everyone experiences the same feeling at the same time. Some examples in various cultures today:

    - Crowd singing at popular music concerts
    - Congregational hymn singing
    - Singing of solidarity songs on picket lines
    - Karaoke singing
    - "Happy Birthday," sung at social gatherings millions of times a year
    - Campfire singing (except by outlaws on the lam)
    - National anthem singing
    - Crowd singing at sports events such as British football matches and ice hockey games

THE EQUESTRIAN SPORT OF ICE HOCKEY

Spectators at professional ice hockey games heartily sing the national anthem at the outset of every game. And throughout the game, they sing various "fight" songs to encourage the home team.

If you live in a tropical country such as Brazil or Nigeria, you may not have heard of the sport of ice hockey. It's a team sport played in northern countries such as Canada and Sweden. Ice hockey resembles the game of polo, except that it's played on a large ice surface called a "hockey rink." The players' horses are fitted with "skates"—long sharp blades welded to the bottoms of the horses' iron shoes. The horses are specially trained to skate rapidly and gracefully around the hockey rink.

Each team has six riders: three forwards, two defense riders, and one goalkeeper. Instead of a long-handled polo mallet, each rider carries a long wooden stick with a blade at the end, called a "hockey stick." The object of the game is to bat a small rubber disk, called a "puck" into the other team's net, scoring a goal.

In ice hockey, riders frequently jostle each other (called "body checking"), causing players to fall from their horses. Often, the fall kills the player outright because the ice surface is rock hard. A player who survives a fall frequently does not make it off the rink fast enough and falls victim to thousands of pounds of horseflesh skating over him or her.

The average professional ice hockey player earns several million dollars a year. But the average playing career doesn't last more than a year or two, due to injury or death.

The rock group, The Doors, wrote and recorded a now-classic song about the equestrian sport of ice hockey, called "Riders On The Storm."

Popular music charts also reflect group participation in music. When not listening to the same hit songs en masse at concerts, people listen to the same songs at the same time on radio, television, webcasts, etc. Masses of young people purchase the same songs during the time those songs ride high on the charts. Rather than listen to a recording, people tend to prefer to go out and get a fix of the same music performed live—to experience the primal pleasure of identifying with, and entraining with, the musicians (and dancers). It's akin to the pleasure of watching professional athletes.

Our savannah-dwelling hominid ancestors walked on two feet but did not stand tall, and had no claws or fangs. Easy meals for lethal predators. So, to protect themselves against strong, fast predators, and to successfully hunt game, hominids had to become sophisticated in group-living and cooperation. Human beings use each other as tools in the survival game. Naturally-selected traits arise in response to environmental pressure, which includes *ourselves*. Hundreds of thousands of years ago, our fellow humans were an integral part of our environment, just as they are

today. So we have evolved many brain adaptations that enable us to interact successfully with each other.

The expansion and evolution of human social structure drove the evolution of many mental tools for social behaviour (such as music and language). The cerebral cortex and the skull, therefore, kept getting bigger and bigger: encephalation. Humans have an encephalation factor of 7, meaning our brains are 7 times larger than would be expected for an animal of our size. Dolphins and porpoises are next, at 4 to 5, with chimpanzees and gorillas at 2.5. The one thing that animals with high encephalation factors have in common is that they're all highly social.

1.5.7 MUSIC AS AN ADAPTATION FOR SOCIAL BONDING: EVIDENCE FROM STUDIES OF CHILDREN AND ANIMALS

Usually, people make music in groups. Children show a pronounced drive to repeat sound elements in rhythmic synchrony. This ensures involvement and belonging with the group. (The same applies to conversation. One of the major ties that binds humans in groups is plain, ordinary talking.)

Both music and language probably have a common origin in long sequences of primate vocalizations in which individuals tried to repeat or match each other's calls. These became formulaic phrases. You can hear echos of this phenomenon in the song-like patter of auctioneers, or in universal children's chants such as "Ring Around The Rosie":

```
                na
na  na                  naaa
          na                    naaa
```

Early hominid vocal music would have consisted of chorusing (and, later, drumming accompaniment). Various animal species exhibit chorusing and duetting:

- Gibbons do a lot of duetting, mainly in mated pairs. Gibbon songs show clear coordination.

- Chimpanzees have distinctive pant-hoot calls, but don't show much coordinated vocalizing. When an individual launches into a pant-hoot, another will sometimes respond.

- Gelada baboons, like humans, sometimes find themselves in socially stressful situations that result in conflict. They spend large amounts of time and energy engaging in friendly vocalizing ("vocal grooming") in order to cultivate and continue relationships. This tends to dispel conflict to some degree.

- Birds sing in groups (the dawn chorus, for example), but their singing is not coordinated or synchronized the way human group singing is. The exception is duetting. Male and female songbirds of many species, especially tropical birds, sing in duets. These monogamous pair-bonded birds sing to advertise their claim to a territory, and possibly to maintain their monogamous relationship.

1.5.8 MUSIC AS AN ADAPTATION FOR SOCIAL BONDING: GROOMING, TROOP SIZE, AND DUNBAR'S NUMBER

Primates and other animals often live in groups or "troops" for protection against predators. As social groupings increase in size and complexity, competitors within the aggregation turn on each other. So cliques form for intra-group protection.

The hypothesis of British anthropologist and evolutionary biologist Robin Dunbar is that, in primates other than humans, alliances hold together because members groom each other. Not because everybody in the group is bug-infested. Because grooming feels good. (Same reason humans like massages.)

Those who groom each other also defend each other when conflicts arise. Grooming takes a lot of time and energy, so primate troops that physically groom each other can't grow beyond a certain size, 50 individuals, tops.

Humans, on the other hand, given sufficient social pressure, can track as many as 150 individuals socially (widely known in anthropology as *Dunbar's number*, after Dunbar's calculations, based on much evidence). So the question is, how come humans can keep track of so many more fellow humans than, say, chimps can of fellow chimps?

According to Dunbar, because language evolved as a substitute for physical grooming. Language enables maintenance of contacts and friendships among many more individuals than would be possible by physical grooming. But it takes a lot of brain power to keep track of so many social relationships. So natural selection came up with some sophisticated brain-based adaptations, especially language. In the grooming-substitute hypothesis, the large human cortex evolved in response to the selective pressure of ever-increasing "symbolic grooming" (language and related adaptations). As other researchers have pointed out, this would especially apply to

child rearing in culturally complex environments, and would include the evolution of music.

Language and music probably have a common origin, as discussed previously. If selective pressure of ever-increasing social structure and complexity drove encephalation, then language and music were probably the main specific adaptations, language for symbolic (referential) communication, music for emotional communication.

Even language has its limits with respect to social interaction. Typically, if four or fewer people are engaged in a conversation, all may participate meaningfully. However, once the group grows to five or six or more, it splits into separate smaller conversational sub-groupings—even though all five or six individuals are physically close together.

This may help explain why popular music groups tend to lose cohesion, musically and socially, as membership increases beyond three or four musicians.

1.5.9 MUSIC AS AN ADAPTATION FOR SOCIAL BONDING: COALITION SIGNALLING

Vervet monkeys produce calls that communicate both referential and emotional meaning. These calls warn their kin of an approaching predator (emotional meaning—fear). Each type of call specifies a different type of predator (referential meaning—snake, eagle, etc.). The vervets react to each type of call with a different escape pattern, depending on the predator indicated in the call.

In humans and in non-human animals, the auditory system connects directly to regions of the brain that control muscles. If you hear something unusual, your body can automatically react quickly. When somebody sneaks up behind you and yells "Boo!", you jump instantly, without a moment's thought.

Music and motor control also go together, as evidenced in dancing, clapping along to a beat, head nodding, and so on. How might our rhythmic and entrainment skills have arisen?

Possibly through coalition signalling.

As selfish gene theory predicts, we humans, like other animals, tend to favour those who carry our genes or those whose genes we carry—our close kin, in other words. Especially our progeny. But humans also have the unique ability to form many friendships and alliances with individuals *in whom we have no kinship investment whatever.* Coalitions.

Music may have evolved as a mechanism to synchronize the mood of all the members of a coalition, to prepare everybody, regardless of kinship status, to act as

a group. Motor activities that have a strong rhythmic aspect, such as walking and running, may have become ritualized in body movements such as group dancing.

The biologists Edward Hagan and Gregory Bryant have provided experimental evidence supporting the hypothesis that music and dancing in groups evolved initially as a coalition signalling system—a way of communicating to others the competence or "quality" of a group. Coalition signalling would likely have evolved from territorial defence signalling, common in other primates.

Coordinated emotional expression of a group amplifies coordinated action. Groups that can successfully demonstrate coordinated solidarity show strength and intimidate would-be attackers. This is why riot police form into coordinated phalanxes, march rhythmically, and beat their shields in time.

Before language evolved, our increasingly social hominid ancestors would have needed some mechanism of identifying, among non-kin, whether all or some of an aggregation of other individuals actually constituted a group, a clique with a purpose. Coalition signalling would help explain the origin of human abilities to identify and evaluate the membership and purpose of a group, and whether or not it would be mutually beneficial to become a member.

1.5.10 MUSIC AS AN ADAPTATION SHAPED BY SEXUAL SELECTION: SEX DIFFERENCES AND THE INNATE TABOO

People looking to justify socially unacceptable behaviour sometimes cite evolutionary theory on the biological differences between men and women.

> "Your honour, my client's genetic inheritance as a male human compelled him to get roarin' drunk and commit armed robberies to get money to buy a guitar so that he could impress his sweetheart with his original songs about good-hearted women in love with good-timin' men. So all charges oughta be dropped."

Evolutionary theory does not provide justifications or excuses. Only explanations. Nature has nothing to do with good or evil; it unfolds with utter indifference. Anyone of either sex has the ability to override natural propensities, as discussed earlier. Humans have free will.

Both males and females have music and language capabilities, but this is not the case for all traits. Arnold Schwarzenegger and all other men carry genes for a uterus, but these genes don't express themselves in males.

Yet, if males and females have the same musical capabilities, why are there so many more male musicians than female musicians in every society globally? How could sex differences be implicated?

For many people, even broaching the subject of sex-based behavioural propensities constitutes a strict taboo. If tangible, empirically verifiable evidence indicates something is true and significant, then declaring the subject off limits for discussion, instead of dealing with reality, amounts to odious Talibanism.

No place for that taboo here. The next few sections discuss sexual selection and music.

THE HILLARY CLINTON PHILANDERING GENE RESEARCH FOUNDATION

Thanks to common descent, humans share many of the same genes with numerous other animals. Maybe that's why some animals exhibit human-like behaviour.

Such as philandering.

Take the humble vole, a tiny furry mouse-like critter. In one species, the meadow vole, the male gets around like Screamin' Jay Hawkins (reported to have fathered some 75 children). But the male of a closely-related species, the prairie vole, typically settles down with one good woman for life. Just like in certain wholesome country songs where things turn out better than they do in certain George Jones songs.

Scientists in Atlanta decided to see what would happen if they transferred a specific gene, suspected to influence philandering behaviour, from the prairie vole to the meadow vole. Sure enough, the investigators found that, by manipulating the expression of a single gene, they could make promiscuous male meadow voles behave like faithful prairie voles.

Since humans have the same gene, could a similar injection be developed to change the philandering behaviour of *human* males? Send your donation to the Hillary Clinton Philandering Gene Research Foundation..

1.5.11 Music as an Adaptation Shaped by Sexual Selection: Sex Differences vs Race Differences

And another thing. Those who would damn any discussion of sex-based behavioural differences also tend to discourage and discredit such discussion by equating it with advocacy of *race*-based behavioural differences—for which no credible evidence exists. The clear implication is that, if you're going to give credence to sex-based differences, then you'll also give credence to race-based differences. And who knows what else. So you're promoting sexism and racism. So goes the smear.

The truth is, sex differences that affect behaviour have been a fact of life in all mammal species for more than 200 million years. In humans, strong evidence indicates evolved sex differences apply as much to the brain and behaviour as to anatomy and functioning from the neck down.

Unlike sex, the concept of "race" has no social value. It poisons social relations. The races humans identify today do not differ significantly from each other genetically. Unlike the sexes, not a single race, however defined (which isn't clear), is represented in significant numbers in every culture globally. *There is no "race" gene.*

DNA and human genome studies indicate all humans are descended from a small group that left Africa perhaps 100,000 years ago. All of our ancestors had dark skin. All of today's so-called races, from blue-eyed blond Scandinavians to Australian aborigines are descended from that one small group of Africans.

Not nearly enough time has elapsed for meaningful adaptations to have occurred that would differentiate one "racial" group from another with respect to *mental* functioning. Selective pressure that leads to behaviour-modifying adaptations has nothing to do with skin color.

Obviously some adaptations in humans have occurred in the past 100,000 years in response to selective pressure. These adaptations show up in traits such as eye color, skin color, facial features, etc. Superficial features of this nature—variable characteristics of external body parts—reflect selective pressure to adapt to conditions of regional physical environments.

Clearly, the highly visible traits that identify racial differences, which neo-Nazis and other such loonies try to spin into "scientific proof" of their nonsensical doctrines, have nothing to do with "superiority" or "inferiority" of human intelligence or character.

In any case, so much intermarriage takes place across racial boundaries that the concept of "racial purity" has little meaning. For example, research indicates some 30% of African Americans have at least one "white" ancestor.

For that matter, you only need to go back a little more than 30 generations (about 700 years, at 20 years per generation) before you discover that the number of your

ancestors *exceeds today's global population*. In other words, literally everybody alive today is related to everybody else.

IN THE BLOOD? NOT BLOODY LIKELY

The age-old mistaken belief that human blood possesses some special power beyond its biological function has not faded away, even in countries with high educational standards.

"Bloodline"

The concept of "bloodline"—holy bloodline, ancestral bloodline—has no basis in reality. Heredity has nothing to do with blood. It's all about genes.

At the level of DNA, every generation gets "diluted" by a factor of one-half. You have only 50% of the DNA of each of your parents, 25% of the DNA of each of your grandparents, and so on. If you could trace your family roots back, say, 200 years (10 generations), you would find that the contribution to your genetic make-up by any of your ancestors from only 10 generations back would amount to a less than 1/10th of 1%. So much for claims about the significance of "royal bloodlines" in the world's monarchies.

Blood Type

Millions of people in Asia believe that *blood type* affects human behaviour. Believers even make important life decisions based on the "psychology" of blood type, such as deciding whom to befriend, hire, or date. There is no scientific evidence whatsoever supporting the daft notion of "blood type personalities."

In countries such as Japan and South Korea, blood type believers who consider themselves to have "acceptable" blood types abuse and discriminate against those who have "unacceptable" blood types. The irrationality and harm of such discrimination ranks with that of racism, sexism, homophobia, and xenophobia.

There is evidence that fear of people who don't look like us has an evolutionary basis. In Palaeolithic times, our hominid ancestors, living in large groups for survival purposes, perceived outsiders as threatening. They probably were. Research findings

indicate modern humans appear to have retained this inclination of distrust and fear. The evidence points to a biologically-based propensity in all humans to discriminate against those "not like us" by virtue of everything from skin color to sexual orientation to religion. However, as discussed earlier, humans have the ability to override such instincts, and many of us do, at least some of the time.

Now, continuing with music and sex differences...

1.5.12 MUSIC AS AN ADAPTATION SHAPED BY SEXUAL SELECTION: EVIDENCE FROM STUDIES OF ANIMALS

Darwin noted that in many species of birds and mammals, males vocalize ("sing") and females don't—or not nearly as much. Moreover, male vocalization occurs mainly in breeding season. The best singers have the best mating success. This is a form of sexual selection. The same sexual selective pressure gave rise to the capacity for music in humans.

There are more than 9,000 species of birds, of which about 4,000 sing. In birds, songs evolved to attract mates or to repel rivals for mates. Sexual selection in birds results in females choosing males with the most elaborate and varied repertoires of songs. Once the female and male have set up house, the male stops singing (sadly). Unless, for some reason, the male loses his mate. Then he goes nuts with singing again (hurrah!).

Male humpback whales sing competitively to attract females. Humpback whales even seem to improvise, like jazz musicians. They sing extended pieces lasting up to half an hour, anytime female humpbacks are in the neighbourhood—not only during mating season.

To be a sexually selected adaptation, music would have to confer reproductive benefits. According to the sexual selection hypothesis, music arose as a courtship display, evident in birdsong, for example. Most animals only ever produce calls during breeding season: birds, frogs, toads, insects, and many other species. And it's almost always males vocalizing to attract females.

Synchronous chorusing (which is not the same as entrainment) in non-human animals may have been the precursor to human entrainment ability. Male synchronous chorusing during mating season is found in some species of frogs and insects. It's automatic and requires no cooperation among individuals. Human synchronous music-making, by contrast, is deliberate and requires true cooperation.

Isometric time-keeping and entrainment may have evolved for the same reason as music-making evolved in other species—to attract mates. Rhythmic singing and dancing would facilitate sexual selection: males *display* and females *choose*. The most

co-ordinated and talented vocalists and dancers would become targets of female selection.

The capacity to do music originated with primitive calls in early hominids and evolved to the point where, today, people in all cultures create extraordinarily sophisticated music. This mode of evolutionary adaptation indicates a *sexually selected arms race* between, as the evolutionary psychologist Geoffrey Miller puts it, "unfulfillable sexual demands and irresistible sexual displays." The great British geneticist and statistician, R. A. Fisher, developed the theory of "runaway sexual selection" to describe how this happens. He cited the peacock's fan as a classic example. It's a flashy trait that signals a high-functioning male.

- Peacocks display big showy tails and peahens select the peacock with the biggest, showiest tail to mate with. The peacock's tail indicates the male's more-than-adequate survival resources, and, therefore, reproductive fitness.

- Their offspring have genes that ensure continuance of the process, creating a positive-feedback loop. (NOTE: *Both sexes* carry the "big showy tail" trait, but the trait is only expressed in males.)

- Eventually, the peacock's tail becomes a handicap instead of a benefit, and the loop gets interrupted.

In humans, musicianship requires a large, highly-functioning brain. Males who display musical skills signal to females that the signaller would make a high quality mate, a mate with a comparatively creative, high-functioning brain. A mate who could make life creative and interesting year after year. Experimental evidence on music preferences indicates that women prefer men who have the ability to surprise them with new songs—to keep them from getting bored with the same old tune. Homo sapiens is a *neophilic* species: we just love novelty. It's what fuels the entertainment industry.

Today, in humans, the most common theme of songs is romantic love. Geoffrey Miller, one of today's leading champions of Darwin's sexual selection theory as the primary driver of the evolution of music in humans, notes that:

> As a tool for activating specific conceptual thoughts in other people's heads, music is very bad and language is very good. As a tool for activating certain emotional states, however, music is much better than language. Combining the two in lyrical music such as love songs is best of all as a courtship display.

Musical productivity in males drops off significantly after marriage.

Only about 3% of mammals are monogamous (compared with 90% of birds). In mammal species that are monogamous, empirical evidence indicates that vocal duetting serves to strengthen pair-bonds. Female gibbons, for example, produce

"great calls," to which male gibbons then respond. Male and female bonobos also sing, and are monogamous.

Moreover, the various monogamous primate species that duet are not closely related biologically, which means duetting and monogamy evolved several times, independently (convergence). This indicates that male-female duetting and monogamy go hand and hand. Isn't that sweet? If you want to keep your spouse around, all you have to do is duet with him or her. Like Johnny Cash and June Carter Cash. Or Tammy Wynette and George Jones (oops!).

"GOODBYE TO LOVE": THE BONOBO'S SONG

In the evolutionary arms race, the human brain has become the ultimate weapon. Humans can and do use cognitive powers to smash the defences of practically all species, which cannot evolve counter-defences against humans fast enough. Consequently, wherever humans show up, species become extinct.

So it is, alas, with the peace-loving bonobo, also known as the pygmy chimp, or jungle hippie. Wild bonobos live only in the Congo. When conflict arises within a group of bonobos, they react by having sex. Lots and lots of sex, including non-vanilla sex. They're famous for it. Unlike chimpanzees, bonobos almost never fight or kill. All they seek is peace, love (i.e., sex), and happiness.

Humans routinely hunt bonobos and eat them. Bushmeat.

Today, the bonobo population has dwindled to a mere few thousand in the wild (from perhaps 100,000 in 1980). If humans succeed in wiping out the bonobo, the jungle hippie will have the distinction of being the first great ape to suffer the fate of the passenger pigeon.

1.5.13
MUSIC AS AN ADAPTATION SHAPED BY SEXUAL SELECTION: DIFFERENCES IN MALE-FEMALE COGNITIVE SPECIALIZATIONS

Over millions of years of evolution, male and female hominids have experienced different selective pressures, resulting in sex differences in behaviour, interests, and preferences.

Although men and women are equally intelligent, male and female brains are wired differently. Males and females are also on different drugs, males on androgens and females on estrogens.

Empirical evidence of male-female cognitive differences contradicts the dogma that cultural and social influences account for all differences in behaviour, skills, and predispositions by sex. Contrary to wishful thinking and political correctness, differences in male-female preferences are hardwired from day one of life. For example, the stereotype that small boys prefer to play with trucks and mechanical objects whereas small girls prefer to play with dolls happens to be true. The great majority of female children, given the choice, select dolls over trucks; male children select trucks—*long before they even know what sex they are.*

This also occurs in our close primate relatives. For example, young vervet monkeys have no concept of "boy-appropriate" or "girl-appropriate" toys. Yet, given a selection of toys, they show the same stereotypical differences in preferred toy choice by sex as human children show.

Some well-documented evolved human female predispositions, skills, and interests include:

- Verbal communication
- Non-verbal communication (e. g., facial expression)
- Empathizing
- People-reading and social interaction
- Identification of objects
- Interest in habitat
- Nurturing
- Mathematical calculation
- Indirect, relational aggression

Evolved human male predispositions, skills, and interests include:

- Tracking moving objects
- Spatial cognition
- Devising systems ("systemizing")

- Risk-taking
- Competitiveness and status-seeking
- Figuring out how objects and events work
- Mathematical reasoning
- Con games and theft
- Direct, physical aggression

This does *not* mean, "All men are more competitive than all women." It does *not* mean, "All women are better at verbal communication than all men."

It means that:

- If you were to select one of the above traits, such as, say, "risk-taking," and

- If you were to find a quantifiable variable that would provide evidence about risk-taking by sex, such as, say, "number of race car drivers," and collect the data,

- Then the theory would predict you would likely find a difference in the number of race car drivers by sex, namely, significantly more males than females; and

- The theory would also predict that, because of the sex-specific, genetic basis for risk-taking behaviour, you would find the same pattern when measuring "number of race car drivers," everywhere in the world, *regardless of country or culture*. In other words, evidence that males have evolved brain circuitry that inclines them towards risk-taking behaviour.

The theory would predict similar findings on measures of any of the above-listed sex-based traits (and many more). For example, to measure the trait, "aggression," by sex, you could compare proportions of male and female prisoners incarcerated for violent crimes. If the theory has predictive value, you would find a much higher proportion of males doing prison time for violent crime (and, as it turns out, males in their late teens and twenties), again, *regardless of nation or culture*. (Interestingly, once pair-bonded, male criminal activity drops sharply.)

"MAKE ME FEEL LIKE A NATURAL MAN"

Here are some personal ads (found floating around on the Internet), supposedly from the *Dublin News*. Each ad has the potential to inspire at least one good country song lyric.

- ✦ Heavy drinker, 35, Cork Area. Seeks gorgeous sex addict interested in a man who loves his pints, cigarettes, Glasgow Celtic Football Club and has been known to start fights on Patrick Street at three o'clock in the morning.
- ✦ Bitter, disillusioned Dublin man, lately rejected by longtime fiancee, seeks decent, honest, reliable woman, if such a thing still exists in this cruel world of hatchet-faced bitches.
- ✦ Ginger haired Galway man, a troublemaker, gets slit-eyed and shitty after a few scoops, seeks attractive, wealthy lady for bail purposes, maybe more.
- ✦ Bad tempered, foul-mouthed old bastard, living in a damp cottage in the ass end of Roscommon, seeks attractive 21 year old blonde lady, with a lovely chest.
- ✦ Limerick man, 27, medium build, brown hair, blue eyes, seeks alibi for the night of February 27 between 8 PM and 11:30 PM.
- ✦ Optimistic Mayo man, 35, seeks a blonde 20 year old double-jointed super model, who owns her own brewery, and has an open-minded twin sister.

A couple of sex-based inborn traits may partly explain the overwhelming male preoccupation with music (discussed in the next section).

- **Males have a particular interest in, and propensity for, tracking moving things.** Music is the "moving art." It's largely about tracking beats—"moving objects"—as they sequence through time.
- **Males have a natural aptitude for spatial cognition** (which, by the way, is associated with the hormone testosterone). As discussed in the section on brain lateralization, the right hemisphere of the brain is the location of both spatial cognition and the processing of harmony and pitch. This indicates the modules responsible for spatial cognition may handle harmony and pitch as "spatial" elements of sound.

THE MORALISTIC FALLACY

When you turn the naturalistic fallacy on its head, you get the *moralistic fallacy*, sometimes called wishful thinking or political correctness. In the moralistic fallacy, "ought" = "is." That is, you

believe that what *ought* to be true actually *is* true—even though there's no logical connection between "ought" and "is."

A familiar example: human males and females *ought* to have the same brain structure and psychological constitution at birth. So (magically)...they *do!* Believing otherwise means condoning sexism. And, therefore, all of the empirical evidence showing that human males and females are in fact psychologically significantly different from each other at birth, shaped in the course of evolution by sex-based differences in adaptive pressures—all that evidence must somehow be wrong (shoot the messenger).

People believe all sorts of things about wonderful human nature—people aren't greedy, people don't lie, people don't cheat—merely because they ought to be true, despite evidence to the contrary.

As in many other species, human females have evolved as mate *choosers.* Human females have to make enormous investments of time, energy, and sacrifice in raising offspring. In North America, for example, women *with children* earn about 75 cents to men's dollar. However, *childless* career women earn just as much as men.

While females have evolved as mate choosers, males have evolved to *display*. Human males tend to become status-and-power *competitors*. Where opportunities arise, females tend to choose (except in cultures where parents arrange marriages) high-achieving (i.e., displaying) male mates.

In Palaeolithic times, men used physical power, aggressiveness, and competitive instincts to achieve status and power, and impress women. Today, men use the same inborn aggressiveness and competitiveness to achieve status and power in business, religion, politics, and justice—and impress women. As listed in Brown's Human Universals, human males dominate the institutions of power in every culture, a fact that will not likely change any time soon, despite wishful thinking. This is a trifle unsettling for the future of *H. sapiens* as a species, considering human males exclusively build and control all the nuclear weapons in all the nations that have nukes.

1.5.14 MUSIC AS AN ADAPTATION SHAPED BY SEXUAL SELECTION: PROPORTIONS OF MALE AND FEMALE MUSICIANS

According to Darwin's sexual selection theory, males write and perform songs to impress females, ultimately for purposes of acquiring women to mate with. Musicianship in males tends to skyrocket after puberty, crests in young adulthood, and declines after marriage.

A male musician is not usually aware that his love of music-making probably stems from an inherently male competitive inclination to impress choosy females with a flashy display, like a peacock, that indicates survival and reproductive fitness. If runaway sexual selection began to shape the evolution of music one or two million years ago, the positive feedback loop would take the form of increasing demands for more impressive displays of musical talent, triggering ever greater cognitive functions, resulting in ever-swelling brain size. The theory would predict that, by now, a lopsided sex imbalance favouring male musicians would exist, regardless of musical genre, regardless of nation, regardless of culture.

And that's precisely what's observed.

For example, one analysis of samples from more than 7,000 albums (rock, jazz, classical) revealed that the overwhelming majority of the principal music makers (more than 90%) were male, regardless of musical genre.

The fact of pan-cultural male dominance of music gets little media attention. Yet flip through any magazine devoted to music, and you'll find that the great majority of composers, songwriters, and performers are male. It's like flipping though the sports pages of any newspaper, and for similar reasons that have roots in the evolutionary history of hominids.

Check out your own collection of recordings. Count the musicians by sex—not just the act's headliner, but *all* the musicians who play on each recording. (More often than not, a female star will have an all-male or mostly-male backing band, and will co-write her songs with male songwriters.) You'll likely find that the overwhelming majority of songwriters, vocalists, and instrumentalists in your own music collection are male, unless you make a point of deliberately searching out and collecting music composed and performed by women only.

Apart from your own collection, another sample worth checking out for male-female proportions is the *Gold Standard Song List* (www.GoldStandardSongList.com), which lists 5,000 songs written over a 100-year period, spanning 14 genres.

All of the above notwithstanding ... just because far fewer women than men become career musicians, that does not mean women *ought* not to have a career in music. If you're a woman, and you write and/or perform music, you may well have heard some variant of the *naturalistic fallacy* with respect to women and music: if it's

found in nature (i.e., more men than women make a living in music), then that's the way it *ought* to be. Rubbish. There's no logical connection between "is" and "ought," which is why it's called the naturalistic *fallacy.* Sadly, in some cultures, adherence to the naturalistic fallacy prevents women who want a music career from having it.

Although the evidence clearly indicates males have a stronger *drive* than females to become musicians, males do not become *better* musicians than females who become musicians. Musical ambition does not equate with inherent musical ability.

1.5.15 Why Is There Such a Thing as Music? How About "All of the Above"

When the smoke clears, why the heck did music evolve in humans— music that's so unlike the vocalizing of any other species?

Summary of three of the leading suspects:

1. Mother-infant Communication

No denying the reality of motherese, nor the universality of it, nor the survival value of it. Much evidence supports Ellen Dissanayake's hypothesis that motherese is, at its core, *musical* communication. Newborns and adults share many of the same musical preferences and skills.

The music-emotion connection originates with motherese and is linked directly with survival. In adults, this would help explain why humans have a high regard for intensely emotional music. Music competently composed and performed *evokes survival-linked emotions* in listeners. That's why audiences highly value performers and composers who can actually achieve such a feat. (Not many can.)

2. Social Bonding

Skinny little hominids would not have survived on the African savannah had they not clumped together in larger and larger groups. By what mechanism did they achieve and maintain group cohesion in the absence of language? Music certainly looks like a good candidate.

Plenty of evidence indicates music and group dancing serve as bonding mechanisms, ways of intensifying group solidarity and coordinating emotional arousal.

For tens or hundreds of thousands of years, since humans acquired the music adaptation, the *only* way to listen to music was in a *group* of a minimum of two—usually more than two. The ability to listen to music in solitude did not become possible until the advent of recording technology in the late 19th Century.

Everywhere in the world, most music-making takes place in group contexts. Groups such as bands, choirs, orchestras, and sports crowds perform for audiences who not only listen but often participate.

3. Sexual Selection

Darwin observed musical courtship displays in many species of animals, notably monogamous bird species, mostly during mating season. Conspicuously by males. According to Darwin's theory of sexual selection, the capacity for music in humans evolved as a sexually selected male courtship display, just as in other animals.

In every society, far more males than females have the urge to make music. *Young* males, predominantly. They say it's for art's sake, but they do it to get girls. It works. It's what would be expected in a sexually-selected trait.

Fisher's runaway sexual selection hypothesis, an elaboration of one aspect of Darwin's theory, would help explain the huge discrepancy in male vs female participation in human music making. While males and females are equally competent at creating and performing music, males tend to become obsessive about it after puberty. Male fascination with music continues until pair-bonding, after which it tends to drop off.

There's no reason to suppose that the various hypotheses about why music evolved in humans mutually exclude each other. It is a fact that the capacity for music, like the capacity for language, is in the brain at birth. After the motherese phase of life, the brain circuitry for music *does not go away*. Music remains a powerful means of emotional communication throughout life.

Mother-infant musical communication is inherently *social*, so it's reasonable that the social nature of music would continue to resonate in adulthood. This would help explain the group bonding properties of music in adults, even if music originally evolved for infant survival.

It would also help account for the use of music in courtship, as both emotional and social communication. As Dissanayake points out:

> In humans, love songs and courtship speech use childish words and refer to childish things to create and display intimacy, for example, … popular songs that express the [sentiment] … "Baby, I love you."

When a guy sings lyrics using words such as "baby," and "mama," he doesn't realize how literal the lyrics are—an adult version of motherese, the musical mother-infant communication system.

(By the way, this has nothing to do with Freud's weird, unsupported hypotheses. While on the mark about each person having an active unconscious mind, Freud's bizarre theory of child psychosexual development, complete with Oedipus complex, Electra complex, phallic stage, and so on, amounts to fanciful hokum.)

Fisher's theory of runaway sexual selection may best explain encephalation in humans. Females select the smartest, most capable males to mate with. Their progeny, *both male and female,* become smarter and more capable over time. Women make ever-escalating demands for smart, capable mates. Men adapt by becoming even smarter and more capable (actually a courtship display). A feedback loop. Over a couple of million years, the cortex gets larger in both sexes.

If this explains encephalation in humans, then the human brain is the human equivalent of the peacock's tail, with human males responding to human females' obsession with brilliance by evolving more ways to display mental prowess, one of those ways—a major one—being music.

A final word on the "what-who-where-when-why" of music, from one of the greatest investigator-songwriters of all time...

In search of love and music, my whole life has been
Illumination, corruption, and diving, diving, diving, diving
Diving down to pick up on
Every shiny thing
Just like that black crow flying
In a blue sky

—JONI MITCHELL ("Black Crow" from *Hejira*)

2

What the Popular Music Industry REALLY Is, and Where It Came From

All music is folk music; leastwise I ain't never heard a horse sing.
—LOUIS ARMSTRONG

2.0.1 A TINY BIT OF HELPFUL MUSICAL HISTORY

This book focuses on specific practical techniques you can use to create and perform emotionally evocative, memorable music and lyrics. As for popular music history and the history of particular genres, any good library or bookstore has hundreds of titles.

That said, this one chapter (out of 12), and one appendix, provide a bit of historical background on popular music of the West. Western popular music—especially African American popular music—is found practically everywhere in the world. Paradoxically, humans tend to resist attempts at so-called "cultural imperialism"—yet plunder each other's cultures when they find something they like. Universal people, universal music.

This chapter briefly surveys more than a dozen major popular music genres that emerged throughout the 20^{th} Century, mainly in America.

2.1 Origin of Popular Music as an Industry

2.1.1 Where the Popular Music Industry Came From

People have created music and lyrics for tens of thousands of years, passing songs on—usually altered—from generation to generation. The oral tradition. Folk music.

In the late 1700s, the Industrial Revolution took hold in England and Western Europe. Millions migrated to the cities for factory work. They brought their folk songs with them. At first, the only places factory workers could go for entertainment were ale houses. They'd get smashed and sing their songs and try to forget their miserable factory lives.

Soon they noticed that other musical entertainment alternatives existed around them in the big city. For instance, the merchant classes attended operas. Staged in actual opera houses. So urban workers started demanding more and better entertainment for themselves. By the middle of the 19^{th} Century, various types of music halls were springing up to meet the demand.

Singers needed material. So, composers and lyricists, some with considerable formal training, supplied the music hall and cabaret performers with new songs resembling classical art songs but informed by familiar folk material. A professional songwriting industry was taking shape. The new musical material did not fit the description of either art song or folk song. Songs composed by professional songwriters for music hall entertainment became more popular than the traditional folk songs.

As well, a new middle class was emerging, better educated and able to purchase and learn to play instruments such as the upright piano. Literate urban dwellers demanded sheet music of popular songs and folk songs. This created a commercial market for mass-disseminated print music.

New music halls for the masses ... professional songwriters turning out songs for stage entertainers ... sheet music for sale to the masses so they could perform the songs at home ... it all added up to a new industry, the popular music industry.

2.1.2 PAYING SONGWRITERS: A MERCIFULLY BRIEF HISTORY OF LEGISLATED COPYRIGHT, MECHANICAL RIGHT, PERFORMING RIGHT

Some songwriters of the 18th and 19th centuries wrote hundreds or even thousands of songs. Publishers printed and sold sheet music of their songs, but the composers and lyricists did not get royalties. In those days, if you wanted to make a living in popular music, you had to play or sing, not merely compose songs.

Although the idea of copyright originated in Europe hundreds of years ago, it wasn't until the 19th Century that national governments legislated the right (in theory, at least) of writers and composers to a share of the revenue from the sale of printed copies of their works (*copyright*).

In 1851, a court case in Paris resulted in songwriters winning the right to get paid for the *public performance* of their works (*performing right*), as in a café or music hall.

In America at the time of Stephen Foster (1826 - 1864), you could make money as a songwriter, but you had to sell your songs outright to a publisher. The publisher was then free to make a fortune selling thousands or even millions of copies of the sheet music. Countless minstrel and music hall troupes touring America and Europe introduced the new songs to the public, songs by Foster, Daniel Emmett (composer of "Dixie"), and others. Millions of people worldwide bought the sheet music, which they played and sang at home. Countless professional musicians and singers made money performing Foster's tunes.

Although Foster sold some of his best songs outright, he has the distinction of being one of the first professional songwriters to demand and get songwriting royalties. At his peak, he actually made a living from sheet music royalties at a time when other songwriters relied on performance fees for their income.

In 1886, the Berne Convention for the Protection of Literary and Artistic Works internationalized this principle (since revised at least half a dozen times). This led to the establishment in France of the industry's first performing rights organization. Italy, Spain, and Austria followed suit, all before 1900. The UK established a performing rights society in 1914 (PRS), the United States in 1917 (ASCAP).

The advent of recorded music in the form of piano rolls and gramophone records made it necessary, beginning with the Berlin Act of 1908 (part of the international Berne Convention), to recognize the right of songwriters to get paid for the "mechanical" distribution of their songs (*mechanical right*).

When radio broadcasting came along in the 1920s, performing rights were extended to include *broadcast performances* of songs, both live and recorded. This was an extension of the principle of getting paid for sheet music sales.

Today, the mechanical right extends to all "mechanical soundcarriers"—CDs in record stores, songs used in movies and commercials, Internet-based song sales, and so on.

The medium that began it all—sheet music—doesn't generate much revenue for songwriters anymore.

2.2 African American Dominance

2.2.1 How America Became the Capital of Western Popular Music

At the time Columbus "discovered" America, the Americas were fully populated, like Europe, with tens of millions of people. The native inhabitants had been making their own music for thousands of years before Europeans invaded the Americas and, with diseases and guns, killed the mass of indigenous Americans. Native American music throughout the Americas has struggled to be heard ever since.

Europeans also colonized large parts of Africa and forced generations of Africans into slavery abroad. They shipped millions of Africans to America to work as plantation slaves.

After the Civil War and the assassination of America's greatest president by a white Southerner, virulent institutionalized racism and legislated segregation became entrenched in many American states. It stayed that way for more than 100 years.

Shut out of mainstream American life, African Americans developed a number of new musical genres, composites of their own African traditions and various European forms, genres that stood out from those of the white majority.

The Europeans who colonized America, initially from the British Isles, France, and Spain, brought with them a variety of musical traditions. Before the advent of the popular music industry, music of white America consisted of European forms such as operetta songs, marches, and dances such as the waltz, schottische, and polka. Music of the Old Country.

From about 1880 to World War I, huge numbers of people crossed the Atlantic to settle in America. Among them were Jews fleeing persecution in the Russian

Empire, many of whom settled in New York. They were to have an enormous impact on American popular song.

American popular song started to come into its own in the 1880s. No other single nation had such a musically fortuitous combination: large population, economic wealth, and, above all, an extraordinary *diversity* of musical roots. A large, economically prosperous population (today, almost 300 million), with one dominant language has historically meant a huge market for popular songs with lyrics in a single prevailing language

If you were to remove all the popular music genres still going strong today that *did not* originate with African American and Jewish songwriters and performers, what would be left? Some folk, classical, country, and some world music That's about it. Today, genres that originated with African Americans pervade or at least inform the popular music of many if not most nations of the world.

The descendants of African American slaves have always created music and musical genres so innovative and compelling that they have tended to dominate popular music, both in America and abroad. Hip-hop is only the latest.

2.2.2 WHY AFRICAN AMERICAN MUSIC TENDS TO DOMINATE POPULAR MUSIC GENERALLY

Over the past couple of centuries, African Americans have combined the versatile melodic and harmonic aspects of European tonal music with their own polyrhythmic and improvisational traditions to create a number of irresistible genres that have spread around the world. Practically everywhere you go on the planet, a large proportion of the recorded and live popular music you hear consists of genres that originated with African Americans—hip-hop, rock, electronica, jazz, blues.

The secret of the global success of popular music genres of African American origin is that they tend to emphasize numerous powerful musical universals *simultaneously*—so many universals that non-African Americans in nations worldwide can relate to the music.

Human nature does not vary from culture to culture. If a human takes a liking to something technical or artistic from another culture, said human will adopt it, without bothering too much about where it came from. If it's an artistic element, and it's emotionally powerful, nothing else matters much.

2.3 Your Musical Roots: How the Major Genres Emerged

2.3.1 "*MY* MUSIC IS BETTER THAN *YOUR* MUSIC"

You've probably heard comments such as "rap isn't music" or "electronic music isn't music." Similarly, some lovers of jazz ridicule country music. And rock fans sneer at sub-genres of rock that devalue "the true spirit of rock."

Mostly, it's a guy thing.

If you're a male, once puberty hits, your hormone-addled brain amplifies the significance of the music you and your peer group identify with. That's *your* music all over the radio and TV and the Internet. Other music sucks, compared with *your* music.

As discussed in more detail in Chapter 7, the songs you're listening to during emotionally significant times or events, such as falling in love for the first time at age 13 or so, get burned into your memory. Whether *your* music happens to be rock, hip-hop, jazz, country, or some emerging genre, the music of your youth eventually becomes your life's soundtrack, or at least a good part of it.

- The life soundtrack of a teen in the first decade of the 21st Century might include the music of Eminem, the White Stripes, Kanye West, or the Dixie Chicks (or any of hundreds of other acts)

- In the 1990s ... maybe Nirvana, Jay-Z, or Smashing Pumpkins

- 1980s ... Wham!, Madonna, or AC/DC

- 1970s ... Bee Gees, Sex Pistols, or David Bowie

- 1960s ... The Beatles, Rolling Stones, or Bob Dylan

- 1950s ... Nat King Cole, Everly Brothers, or Elvis Presley

- 1940s ... Andrews Sisters, Bing Crosby, or Frank Sinatra

Every decade, countless new acts emerge, create new genres, and attract legions of youthful diehard followers. In 2004, *Rolling Stone* magazine published a list of its "50 Greatest Artists of All Time" (I. e., popular musicians and groups).

- Who were the judges? Mainly middle-aged male music writers and critics.
- What musical acts did they select? Mainly those who were big during the judges' youth.
- What was the breakdown by sex of the acts selected? Of the 50 musicians or groups on the *Rolling Stone* list, 46 were male.

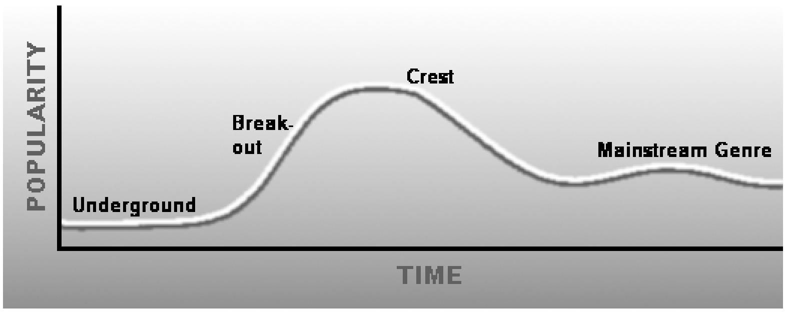
Darwin's theory of sexual selection predicts both the preponderance of male judges and the preponderance of male artists. As people grow up and get married, the music of the present assumes less and less interest and importance, compared with the music of adolescence and young adulthood. For most, by middle age, the music of the present day—"the crappy stuff them young 'uns are listening to"—sounds weird and definitely inferior to all those "great wonderful songs of my youth."

Yet new musical genres that emerge every decade or two, seemingly like clockwork, somehow manage to stick around. Generation after generation.

2.3.2 PHASES OF GENRE POPULARITY: UNDERGROUND, BREAKOUT, CREST, MAINSTREAM

Emerging musical genres go through a characteristic series of phases. The *Gold Standard Song List* (www.GoldStandardSongList.com), if taken as a more or less representative data sample of genre popularity, reveals a *genre popularity profile*. This profile applies to most musical genres over time (Figure 2 below).

FIGURE 2 Genre Popularity Over Time



1. Origins, or "Underground" Phase

- Typically, a musical genre begins as an underground movement. This formative phase often lasts many years, even decades.
- New genres and sub-genres emerge in several ways. Among them:
  - Musicians from outside a geographical region move in and bring new instruments and new styles of playing, singing, and songwriting to an established local musical tradition.
  - A genius comes along and decides to shake things up (Charlie Parker, Bob Dylan).
  - New technology makes it possible to create new sounds.

2. Breakout

- At some point the genre breaks out as a widely recognized musical phenomenon in popular culture.
- The new style attracts the attention of masses of people, including musicians just getting started, musicians working in other genres, music consumers, and music business people.

- Suddenly, performers everywhere are playing in the new style. Lots of the new music get recorded and sold. Over a comparatively short period of time, the new genre or sub-genre becomes all the rage.

3. Crest

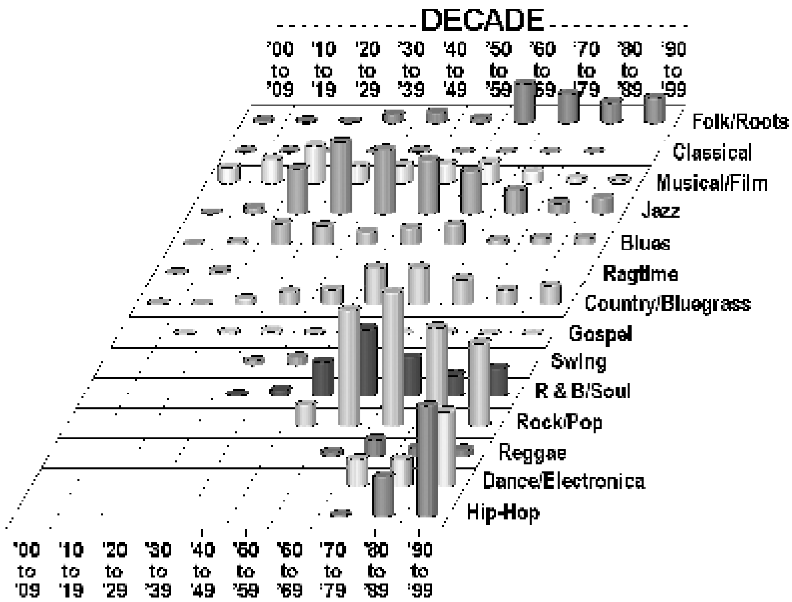
- Inevitably, within a decade or two, the popularity of the genre crests and starts to subside.
- Along the way, it spins off numerous sub-genres.
- The original one does not go away.

4. Mainstream Genre

- Instead, with few exceptions, it remains a permanent mainstream genre, co-existing, influencing, and being influenced by, many others. For example, when bluegrass was "invented" in the 1930s and 40s, it did not replace traditional country music. Neither did "new country," a couple of generations later. When hip-hop and electronic dance music came along, they did not replace mainstream pop or rock.
- So many people accept and adopt the elements of the genre that it becomes a *cultural infrastructure* (more on this a bit later). It settles into the mainstream of popular culture—not as popular as it once was, but permanently accepted and established.
- Every so often a long-established mainstream genre experiences a period of renewed popularity ("revival") that may extend for some years.

The Gold Standard Song List (GSSL) a sample of 5,000 songs over 100 years, provides a visual representation of genre popularity profiles over time (Figure 3):

FIGURE 3 ***Gold Standard* Songs by Genre and Decade**



Today, many young people, while identifying mainly with *their* music (the music of their youth), like to sample music across genres and eras. On a single iPod you might find the Clash, Beethoven, Aretha Franklin, Eminem, Iggy Pop, Bjork, Frank Sinatra, Johnny Cash ....

2.4 Why There's No Such Thing as "Progress" in the Arts, Including Music

2.4.1 PROGRESS MEANS *TECHNICAL* USEFULNESS

As discussed in Chapter 1, natural selection ain't pretty. Animals have to eat other living things, or die. Evolution amounts to a constant arms race. Natural selection equips predator species with adaptations such as powerful leg muscles, sharp fangs, or long claws. Natural selection equips prey species with keen hearing, sight, and smell, the better to escape predators and pass on their genes to the next generation. Such favourable adaptations accumulate in the genomes of both prey and predator species.

In this sense, cumulative mutations amount to a kind of *progress*, even though natural selection has no inherent sense of direction. Suppose keener hearing prevents a prey species such as a rabbit from getting eaten because it can hear an approaching predator and escape to safety under bramble bushes. Then keener hearing marks an improvement, or "progress," over the previous state of hearing, which would not have been keen enough to enable the rabbit to hear the predator creep close enough to pounce and kill the unfortunate rabbit.

Progress means *usefulness* of the adaptation in the evolutionary arms race. If a mutation results in keener hearing and saves rabbits from getting caught and eaten, then it's likely to remain as an adaptation. If another mutation shows up in some unlucky rabbit that reverses hearing sensitivity to the previous state, that individual rabbit will likely get eaten before it passes on the mutated gene, thus *preventing the reversal* of evolutionary "progress" from spreading to other rabbits.

Evolutionary progress, then, goes *one way* only. It does not reverse.

Something similar happens in human culture. Certain aspects of human culture improve or progress, such as science and technology. "Progress" means that, once scientists make a discovery that results in a technology that proves more *useful* than an existing technology, people stop using the existing technology in favour of the new one.

As with predator-prey arms races, such progress does not reverse. Technological progress moves in one direction only. There's no going back. For example,

transportation technologies have shown “progress” over time. Horses and wagons gave way to cars, trucks and trains. Sailing ships gave way to engine-powered ships. Hot air balloons gave way to passenger jets.

Why is there such a thing as progress in science and technology?

Ultimately for the same reason rabbits with keen hearing procreate and rabbits with mediocre hearing get eaten. *Survival advantage*. If you want to compete with FedEx in the courier business, you’d better not rely on Model T Fords and clipper ships.

2.4.2
WHY DOESN’T MUSIC PROGRESS?

Progress applies to the *scientific and technical* aspects of culture. But what about the *artistic* aspects of culture? Do the arts progress? Does music progress?

The answer is no.

Music does not progress, nor do the other arts. The reason has to do with the unchanging nature of the connection between the arts (including music) and emotional communication.

As Darwin correctly pointed out, *emotions are adaptations*. Emotions are permanently encoded in the human genome, and in the genomes of many other animal species. Emotions such as fear, sadness, joy, and anger evolved because they’re critical for survival.

Sound communication systems in non-human animals (hootin’ and howlin’) evolved as adaptations to communicate these emotions. The evidence indicates this holds for the human animal as well. As discussed in Chapter 1, music evolved in humans as a sound communication adaptation, a way to communicate emotion. Since the same connections between emotions and music in humans have likely not changed in the human species for hundreds of thousands of years, these connections are, in effect, *permanent*.

(Technically, they’re not permanent, because a species continues to evolve by natural selection until the species becomes extinct. But adaptations such as emotions and music evolve so slowly that, on time scales of tens or hundreds of thousands of years, you can think of such adaptations as unchanging, for practical purposes.)

Since the brain wiring that connects emotion with music evolved in the Stone Age and has not changed, musical art can never progress, the way science and technology progresses.

The only thing music or any art can ever do is *communicate emotion*.

Emotions evolved as survival adaptations, so when an effective work of art makes an emotional connection, people recognize, perhaps unconsciously, the connection with *survival*. A work of art, such as a song, then, succeeds or fails on the strength of its emotional resonance. If it connects emotionally, it succeeds. If it does not, it fails.

When a work of art succeeds in connecting emotionally, it stays connected permanently, because human emotions don't change over time.

A successful work of art, one that connects emotionally in most people, is called a *classic*. The Canadian literary critic Northrop Frye has this to say about classics of dramatic art, equally applicable to classics of popular song:

> Science learns more and more about the world as it goes on: it evolves and improves. A physicist today knows more physics than Newton did, even if he's not as great a scientist. But literature begins with the possible model of experience, and what it produces is the literary model we call the classic. Literature doesn't evolve or improve or progress. We may have dramatists in the future who will write plays as good as *King Lear*, though they'll be very different ones, but drama as a whole will never get better than *King Lear*. *King Lear* is it, as far as drama is concerned; so is *Oedipus Rex*, written two thousand years earlier than that, and both will be models of dramatic writing as long as the human race endures ... Whitman's celebration of democracy makes a lot more sense than Dante's Inferno. But it doesn't follow that Whitman is a better poet than Dante: literature won't line up with that kind of improvement.

When a new work of art comes along, it does not have any inherent "progressive" advantage over older works of art. ***The concept of progress has no meaning in art.*** A new song, for its newness, has no advantage over an old song.

Any artist working in any medium at any time in human history or in the present day has the potential to create a classic. Once created, a true classic never goes away. It connects emotionally, and human emotions do not go away and do not change from generation to generation. Humans who lived thousands of years ago had the same inborn music-emotion brain wiring that humans have today. And humans thousands of years in the future will still have the same music-emotion brain wiring (assuming humans haven't gone extinct or re-engineered the species genetically).

That's why, as Frye points out, Sophocles' *Oedipus Rex*, written almost 2,500 years ago, remains a successful work of art today, as do Shakespeare's plays. The same goes for Leonardo da Vinci's "Mona Lisa" and Michelangelo's "David," both more than 500 years old.

All of this applies to great songs. Classic songs serve no purpose, scientifically or technologically. The concept of progress has no meaning in songwriting. New songs can never improve upon classic songs, but might themselves become classics.

If a new song moves people emotionally every time it's played or performed for an audience, it will probably never be forgotten. It will probably become a classic, like the majority of the songs on the GSSL. Once a classic, always a classic.

Progress and *change* are two different things. In the arts, *progress* is meaningless, but *change* is both normal and necessary. Music and all the other arts are in a perpetual state of transmutation and diversification. Always were, always will be. That's how a dozen major new popular musical genres emerged in the 20th Century alone.

If you aspire to greatness as a songwriter or performer, you will find that you will have to introduce change and innovation throughout your career, or you will stagnate artistically.

Change does not mean "the old" loses its meaning. Art has nothing to do with *fashion*. With one or two minor exceptions, all of the new musical genres that emerged in the 20th Century *remain in place today*. The new genres that emerged were not more "progressive" than the older genres. They were just different.

Similarly, great artists enjoy long careers because they have the imagination to embrace change, to constantly *reinvent themselves artistically:* Johnny Cash, for example. Joni Mitchell. David Bowie. And especially Bob Dylan, the Shakespeare of popular song.

Artists of this calibre do not abandon their great classic songs. They realize that, once a classic, always a classic. So they perform and re-record their classics in new ways. And they also continue writing and recording new material and exploring other genres for ideas.

But, to reiterate, newness of artistic output has nothing to do with progress. New material may be inventive and innovative, but it's emphatically not *better* than older material, just because it's new.

2.4.3 HOW SONGS ARE USEFUL: MODELS IN CONTROLLED CONTEXTS

As discussed in Chapter 1, biological adaptations such as emotions and music do not evolve unless they confer survival benefits or reproductive benefits, or both.

How does a work of musical art such as a song confer these benefits?

If a work of art succeeds in evoking emotions, it connects with the survival benefits of emotions, but in a *controlled context*.

- A successful work of art enables you to feel negative emotions such as fear, sadness, and anger without experiencing the dangerous or unpleasant real-world circumstances that would normally trigger such emotions.

- A successful work of art also enables you to feel positive emotions such as excitement and joy, which you may not experience often under real-world circumstances.

A successful work of art, then, functions as a *model*, as Frye points out. A work of art must in some way model or demonstrate a possible human situation or experience. Otherwise it will not evoke a response.

Great art, whether literary, visual, or musical, reflects human universals. If a work of art reaches you emotionally, it teaches you something about survival. You may not be able to put it into words, but you remember it.

A work of art is to emotional life what a scientific paper is to intellectual life. Songs and paintings and novels serve as emotional "lab demonstrations," so to speak. They teach us how to survive.

Just as science illuminates some aspects of reality using torches of reason, art illuminates other aspects using torches of emotion. Humans learn from both. Great works of art provide society with benefits every bit as useful as the benefits derived from scientific research.

2.4.4
THE AGE AND BEAUTY OF CLASSIC SONGS

The older a still-remembered song, the more likely it's a song people regard as a timeless classic. (The GSSL, for example, contains nearly 1,200 songs composed between 1900 and 1949.)

Today, millions of people under the age of 30 hum and sing and buy zillions of recordings of songs that were written before they were born—the songs of Bob Dylan, Hank Williams, the Gershwins, Jimi Hendrix, Lennon and McCartney, Cole Porter, Hoagy Carmichael, Joni Mitchell. Classics.

Classic plays such as Shakespeare's *Hamlet*, and classic ballets such as Tchaikovsky's *Swan Lake* transcend time, place, and interpretation. So do classic songs, such as Gershwin & Heyward's "Summertime," written in 1935. Like *Hamlet* and *Swan Lake*, "Summertime" has never lost its appeal and today is known and performed the world over.

NOTE: Many songs on the GSSL written in the last quarter of the 20th Century will *not* become classics. More time must pass (several decades) to know for sure. Some of these songs will undoubtedly fall away and be forgotten. Selecting songs for the GSSL from the late 20th Century that might become classics was necessarily a matter of educated guess work.

2.4.5
HIT SONGS VS GREAT SONGS

> Every generation laughs at the old fashions but follows religiously the new.
>
> —THOREAU

A person who equates "classic" with "too old" does not understand the difference between fashion and art. In popular music, fashion means current chart hits.

If you want to learn about songwriting from other songs, steer clear of pop music fashion shows such as the *Billboard* charts and MTV and all other charts and listings of current singles, albums, and videos. Nearly all of the songs you find there will be long forgotten in 5, 10 or 15 years. Stripped of slick production values, they're banal songs.

While most of the tunes that make it onto the *Billboard* charts eventually vanish, never to be heard again (deservedly), a small fraction of them—a tiny fraction in relation to the total number that make the charts—don't fade away. Years and years later, people still play and sing them. Artists still record them. You hear them in clubs and bars, at concerts and festivals, in movie soundtracks and commercials.

Youth of the 1960s were fond of reminding each other never to trust anyone over 30 (a mantra that curiously faded away in the 1970s). With respect to songs as models to learn from, a practical guide—not a hard and fast rule—would be, "Never trust a song *under 30*."

"Georgia On My Mind," "Dancing In The Street," and "September Song" were once hit songs. Now they're classics. They continue to connect with a lot of people emotionally, year after year.

Billboard and MTV chart-topping singles and albums may sell millions of copies today—but that says nothing about the long-term staying power of either the recordings or the songs.

People buy new CDs or download new singles by big-name artists for a lot of reasons that have nothing to do with the songs themselves.

- MC Mook says you gotta get it. So you get it.
- Advertising hype says you gotta get it. So you get it.
- The artist has a cool rebellious image that you identify with. So you buy the CD in the expectation that some of that coolness will rub off on you.
- In the video, the artist is unbelievably hot, so you buy the CD.
- Your non-conformist peers all have the CD, so, to maintain your non-conformist credibility, you buy the CD.
- Your sister's birthday is coming and you have to buy a present.
- Christmas is coming and you have to buy a bunch of presents, and CDs solve the problem relatively cheaply and easily.

Next thing you know, the hit recording has sold 8 million copies—95% of them to 12-to-19-year-old males. Five years later, nobody can remember a single song from the CD. The now 17-to-24-year-old owners of the CD have moved on to fashionably new artists and their music.

So ... never mind the hit machinery that creates the *Billboard* and MTV charts. Unless you're only interested in commerce and fashion. In which case, you are not an artist. You are a hack.

But hey! It ain't so bad, being a hack. Although Woody Allen's no hack, he recognizes the value of art to those who would seek immortality:

> I don't want to achieve immortality through my work. I want to achieve it by not dying.

Mind you, look at Elvis. He actually achieved immortality by not dying. He's been spotted thousands of times since 1977, when he decided to retire to a more normal life. Today, he drives a cab in Muscle Shoals, Alabama. Every so often he makes a public appearance, such as the time he entered an Elvis impersonator contest in Wichita, Kansas, and came in third.

2.5 Musical Genres as Cultural Infrastructures

2.5.1 NEIL YOUNG GOT IT RIGHT: THE NATURE OF CULTURAL INFRASTRUCTURES

> *My my, hey hey*
> *Rock and roll is here to stay*
> —NEIL YOUNG ("My My, Hey Hey")

It's not just rock 'n' roll that's here to stay. It's also hip-hop and jazz and country.

A musical genre is a *cultural infrastructure*—something so many people know about and support that it becomes a more or less permanent artistic (or technological) fixture in the mainstream of society.

You cannot easily dislodge an infrastructure, even if you and a lot of others would prefer something else in its place. Technological infrastructures especially have monopoly characteristics. The internal combustion engine and the Microsoft Windows operating system are technological infrastructures. A lot of people don't particularly like either of them. But, as is characteristic of infrastructures, they stick around because so many people use them, and alternatives have unappealing drawbacks (inconvenience, lack of support, expense, etc.).

2.5.2 HERE TO STAY: THE LANGUAGE YOU SPEAK

The language you speak is a cultural infrastructure. Everybody who speaks the language you speak shares the same vocabulary (more or less) and uses the same grammatical rules.

Artists working with language manipulate words and grammar to create works of art such as novels, plays, and song lyrics. Successful language-artists innovate with words and grammar, but preserve enough of the language's commonly-used vocabulary and observe enough of its grammatical rules to ensure reasonable audience accessibility.

As mentioned in Chapter 1, artists who break *all* the rules do not communicate with anyone on any humanly accessible level.

If an artist working with language employs too much fractured grammar and too many twists of vocabulary, the novel or play or song lyric becomes incomprehensible. Without adequate adherence to convention, audiences find the work inaccessible and simply turn away from it, confused and irritated.

2.5.3 HERE TO STAY: THE MUSICAL GENRE YOU WORK IN

When several languages blend to form a new language, the new language tends to have a unique identity with a unique vocabulary. Those who don't know the language cannot understand it until they learn the language, because words have referential meaning.

Not so with music.

When several musical genres blend to form a new one (such as rock, originally a blend of R & B and country), the new genre can easily be understood. You can

recognize a tune whether it's played as a rock, jazz, or country arrangement because musical notes do not have referential meaning.

Like languages, musical genres are cultural infrastructures.

Most musical genres, once established as infrastructures, do not fade away (although, like some languages, some musical genres have become extinct for various reasons. A couple of examples are noted below). A musical genre functions something like a language. Each musical genre has a particular set of stylistic elements, which millions of songwriters and performers working in the genre observe. These elements define a genre, just as vocabulary and grammatical rules define a language.

An established genre does not go "out of date," any more than an established language goes out of date. Musicians use various technologies to create music, and those *technologies* go out of date. New instruments and electronic gear render old gear obsolete. But musical genres, being art forms and not technologies, do not progress.

- Punk rock, for example, emerged in the 1970s. Today new punk bands are forming all the time. Their members write new punk songs and record them on equipment that's different than the gear that existed in the 1970s. Moreover, when hip-hop and electronic dance music came along, they did not replace punk.

- Same with bluegrass. New bluegrass bands are constantly forming, performing and recording both classic and new tunes in the bluegrass tradition. When bluegrass was "invented" in the 1930s and 40s, it did not replace traditional country music. Neither did "new country," a couple of generations later.

All of this applies to every major genre and sub-genre: heavy metal, hip-hop, jazz, blues, reggae, folk, electronica.

Songwriters and performers create new genres and sub-genres of music all the time. Some stick around and become cultural infrastructures, some don't.

2.5.4
KNOWING SOMETHING ABOUT "FOREIGN" GENRES WILL HELP YOUR MUSICAL DEVELOPMENT

Listening to the great songs of other genres will spark your musical imagination. You will be able to better envision how you could incorporate elements from other genres

into your own musical art, the way language artists incorporate elements of style, grammar and vocabulary from other languages into their works.

The more you listen to, remember, and absorb at least a sampling of the best songs of genres other than your own, the more likely you will be able to create a unique body of original songs and a performing style that sounds like nothing anyone's heard before. A sound that grabs the ears of audiences and holds them. A *signature sound and style* (see Section 11.2).

2.6
A Brief Look at the Major Genres of Western Popular Music

2.6.1
WHAT "GENRE" MEANS (HERE, AT LEAST)

What conditions define the emergence of a new genre in popular music?

- The new music contains a set of several significant stylistic elements not widely heard *in that particular combination* in other musical genres.

- A lot of performers and songwriters adopt the new set of stylistic elements in their playing, singing (including rapping) and songwriting (including beatmaking).

- A large number of performers and songwriters *maintain* the use of the set of stylistic elements over time.

Recall from Chapter 1 that music is combinatorial. A *finite* set of stylistic songwriting and performing characteristics define a particular genre. For example:

- Musical instruments of choice
- Dominance of vocal vs instrumental songs
- Characteristic vocal style
- Dominant subject matter of lyrics

- Variable emphasis on elements such as rhythm, harmony, melody, vocal style, instrumental solos
- Dominant type of rhythmic pulse
- Characteristic tempo range
- Degree of emphasis on improvisation
- Degree of emphasis on syncopation
- Variable use of modes and scale types

And scores of others.

Since music is combinatorial, all it takes is a handful of musical elements and a set of rules governing each that a significant number of musicians agree to play by. The result: music strikingly different from any other.

Imagine, for example, what country music would have sounded like if, in place of the steel guitar as a key element of the country sound, *bagpipes* had had that role from the beginning. That single instrumental difference would have made country music sound a whole lot different from what we're accustomed to hearing today.

A major genre of popular music typically spins off numerous sub-genres. For example:

- In jazz, a couple of spin-offs were bop and fusion (among many others)
- In country, honky tonk and bluegrass (again, among many others)
- In rock, metal and punk
- In R & B/Soul, Motown and funk
- In hip-hop, gangsta and crunk

There are hundreds and hundreds of sub-genres and sub-sub-genres.

At last count, there were 647,512 genres and sub-genres in popular music.

No, wait! Some guy with his laptop in his bedroom in Milton Keynes, England, has just created another one. That makes 647,513.

No, wait!

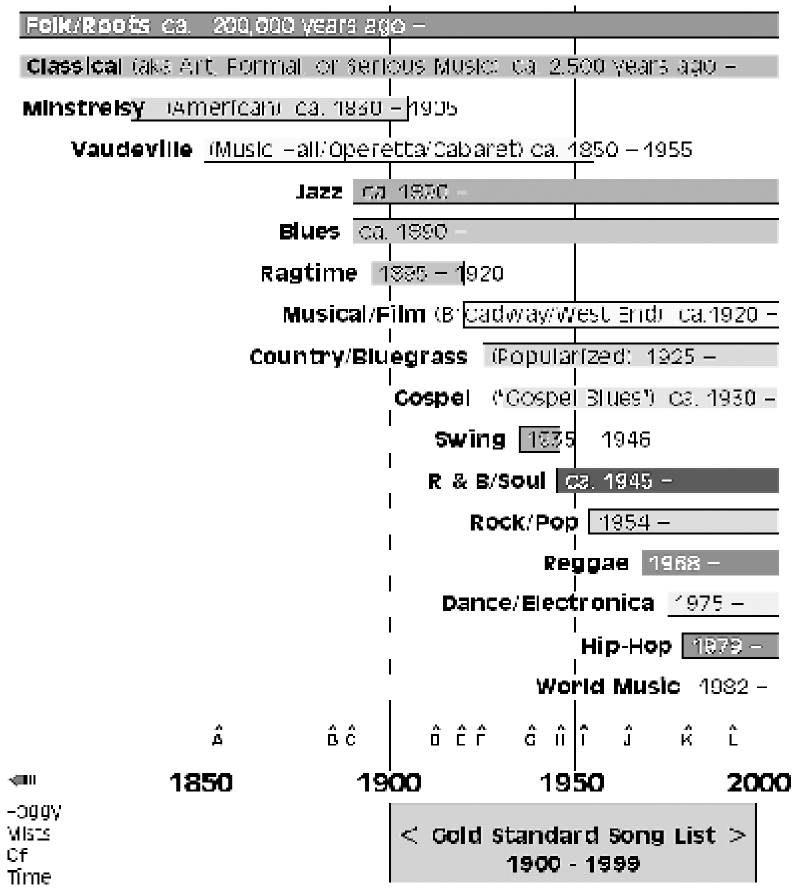
A trio of 14-year-old girls in Amarillo, Texas, has just created a sub-genre of a sub-sub-genre. Now we're up to 647,514.

No, wait! ...

2.6.2 GENRES EMERGING OVER TIME

Figure 4 below shows the major genres of Western popular music (at least in the main English-speaking countries) from approximate breakout dates to the present. The GSSL only applies to the right half of Figure 4.

FIGURE 4 Genre Breakouts In Historical Perspective



A FEW SIGNIFICANT DATES IN THE HISTORY OF POPULAR MUSIC

A 1850s Stephen Foster's greatest hits
B 1886 Berne Int'l Copyright Convention
C 1890 Commercial recording begins
D 1914 ASCAP established
E 1920 Commercial radio begins
F 1926 First movies with sound
G 1939 BMI established
H 1948 Regular network TV begins
I 1950-54 Fender Tele & Strat; Gibson Les Paul
J 1964 Moog synthesizer
K 1981 MTV begins
L 1994 Internet becomes mainstream

Occasionally, a major genre, after flourishing for a time, becomes extinct, such as ragtime and American minstrelsy. Usually the reason is that another genre comes

along with similar, but not identical characteristics, and absorbs the first one. For example, vaudeville took over from minstrelsy. Later, the Broadway-style musical succeeded vaudeville. That does not mean the Broadway musical represented artistic progress over vaudeville. Many Broadway style revues use elements pioneered in vaudeville, but presented with technologically updated stagecraft.

Following are brief sketches of each of the genres represented in Figure 4 above.

2.6.3 FOLK/ROOTS MUSIC, CA. 200,000 YEARS AGO TO THE PRESENT

Origins

Folk music has several alternative names, such as *community music, people's music*, and *music in the oral tradition.*

Folk music likely goes back 100,000 to 200,000 years—before *Homo sapiens* walked out of Africa and colonized the rest of the planet.

To get an idea of how old folk music is, have a look at the horizontal bar at the top of Figure 4 above. It represents only 200 years. Now imagine this: to accurately represent 100,000 to 200,000 years, that horizontal "Folk/Roots" bar would have to stretch to the left roughly 190 to 380 feet (58 to 116 metres)! If you went riding out of Dodge, looking for the origin of folk music, you would get so lost that not even a halfway competent posse on fresh horses hand-picked by Sadie and Ellie Sue from the Dodge City Horse Store, a posse led by Marshal McDillon himself, would ever be able to find you. That's how old folk music is, compared with all other musical genres.

With the advent of the printing press in the 15th Century, vendors hawked "broadside ballads" in the streets—folk ballads printed on one side of a sheet. Early journalism.

Breakout

In English-speaking countries, the folk music of the UK and Ireland had a major revival that began in the late 1950s and rocketed in popularity in the early 1960s. Countless musicians in the UK, America, Canada, and other English-speaking nations wrote countless original songs in the English-Celtic folk tradition.

Crest

The folk music revival crested in the latter part of the 1960s and gave rise to sub-genres such as folk-rock (Dylan, the Byrds, etc.) and the folk-soul music of artists such as Van Morrison (for example, the beloved album *Astral Weeks*).

Mainstream Genre

Today, the term "roots" often appears in conjunction with folk music. The folk music revival subsided in popularity, and folk/roots settled into the mainstream of popular culture by the 1980s.

2.6.4
"CLASSICAL"/ART/FORMAL/SERIOUS MUSIC, CA. 2,500 YEARS AGO TO THE PRESENT

You could define classical music ultra-narrowly as the music of an era, the period of European art music of ca. 1750 to 1825 (Haydn, Mozart, Beethoven) that followed the baroque era and preceded the romantic. Or you could define classical music broadly as formally-notated art music, starting with some of the music of the Greeks, 2,500 years ago. In which case, the bar second from the top in Figure 4 above would need to stretch to the left about 4.8 feet (1.5 metres). Not a long time compared with folk music, but much longer than the genres of popular music with which we're familiar today.

Historically, racism prevented music from crossing cultural lines. For centuries, Europeans and white Americans considered African music "primitive" and inferior to music of European origin, especially the music of the baroque, classical, and romantic composers of the common practice period (1600 - 1900). People with classical music backgrounds have historically tended to value melody and harmony over rhythm and rhythmic lyrics. The European aristocracy of the common practice period who patronized composers actually believed they were fostering the "progress" of music.

At classical music concerts, audiences were (and still are) expected to sit quietly and listen to The Music. No nodding to the beat (or nodding off), no tapping, clapping, or (horrors) singing or dancing. Pretty much the exact opposite of, say, a hip-hop or rock concert.

2.6.5
MINSTRELSY (AMERICAN), CA. 1830 - 1905

Origins

American minstrelsy emerged in the 1830s. White musicians, mainly solo or duo acts, would black-face themselves and perform songs and dances from African American culture.

Horrible racist stereotyping ("See the happy dancing plantation slaves!") didn't bother audiences of the day. Even Thomas Jefferson (1743 - 1826), author of the famous phrase, "All men are created equal," kept a couple of hundred slaves and did not see fit to free them.

Breakout

By the 1840s, troupes of 5 or 10 players were common, mainly white males, but not exclusively.

Abolishionist minstrel troupes had some success.

America successfully exported the minstrel show to Europe. Of course minstrels had been a fixture in Europe for centuries, but the American style minstrel show was something else.

Crest

After the Civil War, troupes grew larger, and there were more African American troupes.

Here is one description of American minstrelsy:

> The typical entertainment included instrumental numbers, novelty acts (acrobats, characters in animal costumes, dancers, and circus or museum oddities), short skits, opera burlesques, parodies of urban concert life, comic and sentimental songs, and ensemble dance numbers.

Mainstream Genre

James A. Bland, America's first great African American songwriter ("Carry Me Back To Old Virginny," official state song of Virginia), wrote hundreds of songs but

did not make any money on royalties. However, he did earn a good living as a member of various minstrel troupes.

Stephen Foster, an abolishionist northerner, wrote many songs for minstrel shows, with lyrics in dialect that did not mock or denigrate plantation slaves.

In the decades following the Civil War, the racist nature of much of minstrelsy led to its demise, concomitant with the rise of vaudeville, which had taken over from minstrelsy as variety stage entertainment by the first decade of the 20th Century.

2.6.6 MUSIC HALL/VAUDEVILLE/OPERETTA/ CABARET, CA. 1850 - 1955

Origins

The Industrial Revolution began in the latter half of the 18th Century and dramatically transformed European and North American society. Decade after decade, people migrated from the countryside to work in urban factories and foundries.

Workers demanded more and better entertainment than simply congregating in ale houses and singing traditional songs. By the mid-1800s, music halls were meeting that demand with a variety of entertainment for the working masses.

Breakout

Some musicians became professional songwriters, furnishing music hall entertainers with new songs. This marked the beginning of the modern popular music industry.

Crest

In America, a decade or two after the Civil War, music hall entertainment became established in North America in the form of vaudeville. It eventually superceded American minstrelsy.

Other varieties of music hall entertainment included operetta (in both Europe and North America) and cabaret (mainly Germany and France).

Great composers and entertainers of the music hall/vaudeville age include: Gilbert and Sullivan, Noel Gay, Harry Lauder, Vera Lynn, Victor Herbert, George Formby, Noel Coward, George M. Cohan, Albert and Harry von Tilzer, James

Reese Europe, Eddie Cantor, Fanny Brice, Al Jolson, Sophie Tucker, Bert Williams, and Rudy Vallee.

Mainstream Genre

At the turn of the 20th Century, vaudeville was the most popular form of entertainment in North America, as was music hall culture in England.

All major cities and towns in Europe and North America had music halls to accommodate "light" entertainment variety shows.

In America, other ways of presenting variety entertainment, especially radio and film, began to displace vaudeville in the 1920s. However, the music hall genre lived on in Europe for several more decades.

The Broadway style musical replaced the vaudeville show as stage entertainment. Eventually all of the elements of vaudeville and music hall had migrated to other media or were no longer referred to by their original names (e.g., musical revues, movie musicals, and television variety and talk shows).

The Beatles recorded a landmark album in the British music hall tradition: *Sgt. Pepper's Lonely Hearts Club Band* (1967).

TIN PAN ALLEY

Jewish immigrants who arrived in America between 1880 and 1910 found themselves discriminated against and barred from many professions. Some turned to what were then considered "low-life" entertainment industries: movies and popular music. They founded Tin Pan Alley, America's popular music songwriting and publishing industry.

In the 1880s, the vaudeville houses clustered around New York City's Union Square, which became the first home of Tin Pan Alley. As the entertainment venues moved north, so did Tin Pan Alley, to 28th Street between 5th Avenue and Broadway.

Tin Pan Alley did not get its name until around 1903, after it had moved to 28th Street. The name came from the sound of the out-of-tune pianos in the publishing houses on both sides of the street. (London, England, had its version of Tin Pan Alley—Denmark Street.)

From the1930s to the 1950s, Tin Pan Alley moved north again, up to 42nd Street, hub of the theatre district and the broadcasting and east coast recording industries.

By the 1960s, record company A & R directors had taken over from publishers and the name Tin Pan Alley faded.

The Tin Pan Alley era was the golden age of non-performing songwriters (ca. 1885 - ca. 1965). In the 1960s, bands and songwriters who wrote and performed their own material took over the popular music charts.

Since the 1980s a number of producer-songwriters—non-performers who write and produce songs for pop stars—have become successful. So, in a limited way, this marks a return to Tin Pan Alley.

2.6.7
JAZZ, CA. 1890 - PRESENT

I'm very glad to have met you, Mr. Sartre. I like your playing very much.
—CHARLIE PARKER
upon meeting Jean-Paul Sartre at a gig in Paris, 1949

Origins

Jazz started in the early 1890s in the port of New Orleans, a city that was once a French colony. The African American musical culture of syncopation, polyrhythm, melodic embellishment, and improvisation mashed up with European (especially French military) musical traditions and instrumentation: marches and rhythmically "square" dance forms, brass instruments, and the upright piano.

New Orleans Creole musicians (American born, of African American and European—especially French—ancestry), such as Buddy Bolden, King Oliver, Kid Ory, and Jelly Roll Morton, lived with, and played music with, self-taught African American musicians. Altogether they created a new genre, jazz.

Breakout

The Original Dixieland Jazz Band made its first recording in 1917. By the 1920s, the Mississippi riverboats had carried jazz north to Kansas City, Chicago, and New York. Not long after, jazz had spread all over America and on to Europe. (Recall that in the 1930s, the Nazis banned jazz.)

White musicians played alongside black musicians, helping to focus more attention on the appalling state of racial discrimination and segregation that had

existed since the botching of emancipation at the end of the Civil War in 1865. Later, jazz musicians such as Louis Armstrong played a role in sparking the civil rights movement of the 1950s and 1960s.

Crest

By the late 1920s and early '30s, jazz musicians were transforming hundreds of well-crafted songs for Broadway musicals (written mainly by Jewish immigrants and their progeny, who had fled persecution in Europe and Russia) into what would later be known as jazz standards.

Composers and band leaders such as Duke Ellington were writing brilliant pieces for the jazz orchestra. Historically, most of the great innovators in jazz have been African Americans: Louis Armstrong, Ellington, Dizzy Gillespie, Charlie Parker, John Coltrane, Miles Davis.

By the late 1930s, with the success of swing-era big-bands lead by the Dorsey Brothers, Benny Goodman, Glenn Miller, and others, jazz was the most popular musical genre in America, eclipsing "square" interpretations of Broadway show tunes.

Mainstream Genre

At the end of World War II, the popularity of jazz was starting to decline. The advent of bebop sustained a healthy interest in jazz well into the 1950s, after which several other emergent genres took the spotlight. Today, jazz remains a solid mainstream genre, showing no signs of fading away.

Jazz brought improvisation back from near-extinction in Western music. Improvisation combines the creation of music with the performance of music. The hallmark of jazz is that the performer composes while performing—improvises—although the performer follows some sort of model or form (see Section 7.9.2).

2.6.8 BLUES, CA. 1890 - PRESENT

Origins

After the emancipation, African Americans found themselves shut out of mainstream society, living in nightmarish conditions of poverty and racial segregation. The Ku Klux Klan organized lynch mobs that murdered thousands of African Americans, beginning in the 1880s and continuing into the 1960s.

The blues began in the Mississippi delta in the late 1880s or early 1890s, with former slaves and their progeny singing about their tragic lives of discrimination, broken dreams, shattered families, and alienation. And disappointment with lovers. And satisfaction with lovers. And ambiguity about lovers.

Unlike jazz, the blues was mainly rural in origin. It began as a wholly African American folk music genre.

With voice, guitar, and harmonica, blues musicians combined pentatonic and diatonic scales to create blues scales—hybrid scales with "blue" notes (see Chapters 4 and 5). This black folk/country music didn't sound much like either jazz or white country music.

Breakout

With the proliferation of recording studios and the advent of radio in the 1920s, the blues began to find audiences to a limited degree outside the deep south. But the blues never did break big time, not the way jazz did.

The ASCAP musicians' strike (American Society of Composers, Authors and Publishers) helped the cause of the blues. The strike led to the formation of BMI (Broadcast Music Incorporated) in1939. New labels and BMI publishers signed many African American blues musicians to make recordings to meet the demand for fresh music for radio broadcast.

Crest

In the late 1950s and throughout the 1960s, the folk music revival rekindled interest in authentic African American folk music. Many blues musicians who had been playing in obscurity for decades suddenly found themselves performing and recording for large and appreciative audiences.

Mainstream Genre

As with other genres, interest in the blues waxes and wanes. Like jazz, the blues will be around for generations to come.

Some important blues songwriters and performers include Blind Lemon Jefferson, Pine Top Smith, Leadbelly, Charley Patton, Leroy Carr, Bessie Smith, W. C. Handy, Robert Johnson, Ma Rainey, Blind Willie McTell, Son House, Howlin' Wolf, Willie Dixon, Muddy Waters, Etta James, and B. B. King.

2.6.9
RAGTIME, CA. 1895 - 1920

Origins

Ragtime was a style of piano-based syncopated jazz that emerged in the mid 1890s. Some musicians played ragtime on other instruments, such as the banjo.

Like New Orleans jazz, ragtime had roots in the "square" marches and dances of Europe, combined with African American syncopation.

In ragtime piano style, the left hand plays a "square" march rhythm or dance rhythm against the right hand's syncopated melody, resulting in a characteristic "ragged" sound.

One of the main differences between ragtime and New Orleans jazz was that ragtime was usually (but not always) formally composed and notated, whereas jazz was usually (but not always) improvised. Some musical historians argue that much ragtime music was completely improvised, but only the composed pieces remain for the record, as do ragtime piano rolls.

Rhythmically, both New Orleans jazz and ragtime were syncopated, yet sounded markedly different.

Breakout

Ragtime became all the rage for a few years, both in America and Europe during the first decade of the 20th Century.

Crest

As spectacularly as ragtime had broken out, it died away, and by the 1920s had all but disappeared.

Mainstream Genre

As a major musical genre, ragtime was rare in that, after a wildly successful breakout, it ultimately did not survive, not even as a sub-genre of jazz. By the 1920s, ragtime had pretty much disappeared, while jazz moved into mainstream popularity.

Some ragtime greats: Scott Joplin, Joseph Lamb, James Scott, Eubie Blake, Vess L. Ossman, and Ben Harney.

The movie *The Sting* (1973) briefly revived interest in ragtime. Some ragtime tunes, such as "The Maple Leaf Rag" and "The Entertainer," have become great classics.

Good songs don't go out of style, but occasionally good musical styles go out of style for good. Or something. For a good rag time, track down the music of ragtime xylophone player Morris Palter, one-time percussionist in the Canadian alt-rock band Treble Charger.

2.6.10 MUSICAL/FILM (BROADWAY/WEST END), CA. 1920 - PRESENT

Origins

Europeans brought music hall style variety entertainment to America, where music hall became vaudeville. Tin Pan Alley supplied the songs.

By the late 1920s, America had created its own version of music hall entertainment in the form of the Broadway musical, which supplanted the vaudeville show.

Whereas a vaudeville show was a variety revue, a Broadway musical was a full-length, plotted, character-rich story with a central theme and a set of songs written for the show by professional Tin Pan Alley songwriters.

Breakout

The first great Broadway musical was *Showboat* (Jerome Kern and Oscar Hammerstein II, 1927). Within a few years, Broadway-style musicals were playing everywhere, including London's West End and Dodge City's Wrong Ranch Saloon.

Crest

Jazz eclipsed Broadway musical theatre in overall popularity in the 1930s, but Broadway kept right on churning out shows (and filmed musicals), supplying the jazz world with a steady stream of wonderful songs that have become jazz standards.

Richard Rodgers, one of the greatest songwriters ever, composed all of his songs, except "Blue Moon," for musicals. The GSSL lists more than 50 of his tunes.

Mainstream Genre

Some great writers of songs for Broadway musicals and films include: Jerome Kern, George and Ira Gershwin, Cole Porter, Harry Warren, Kurt Weill, Irving Berlin, Vincent Youmans, Vernon Duke, Harold Arlen, Richard Rodgers, Sammy Fain, Sammy Cahn, Julie Styne, Frank Loesser, Jimmy van Heusen, and Stephen Sondheim.

Broadway-style musical theatre is still with us, and probably will be for the foreseeable future. However, with the emergence of so many other great musical genres in the second half of the 20th Century, the profile of the Broadway musical has diminished markedly within mainstream popular culture.

2.6.11 COUNTRY/BLUEGRASS (POPULARIZED), 1925 - PRESENT

Origins

In the 1700s, settlers from Britain, Ireland, and Scotland brought their folk songs and instruments to America. Soon they were composing their own tunes, telling their own stories, and singing and playing their instruments in their own new ways.

This gave rise to a new, uniquely American musical genre, originally called hillbilly or mountain music, then country and western, then just country music.

Breakout

As a national mainstream genre, American country music broke out in the 1920s when radio spread throughout America. In 1925, George D. Hay started the Grand Ole Opry, a radio showcase for country music. By the late 1920s, country music had its first national star act, the Carter Family.

The talent scout and record producer Ralph Peer recorded some of the first great country music acts. Peer discovered both Jimmie Rodgers and the Carter Family.

Crest

Country music continued to grow in popularity throughout the 1930s and 1940s, spinning off exciting sub-genres such as bluegrass and Texas swing.

Starting in the late 1940s, Hank Williams, Sr., Lefty Frizzell, Johnny Cash, Marty Robbins, George Jones, and other giants of the genre took country music into its golden age, which crested in the 1960s.

Mainstream Genre

Among the greatest country songwriters and performers are: Uncle Dave Macon, Jimmie Rodgers, the Delmore Brothers, Gene Autry, Tex Ritter, Hank Williams, Sr., Bob Wills, Bill Monroe, Patsy Cline, Jim Reeves, the Carter Family, Lefty Frizzell, Ernest Tubb, Chet Atkins, Marty Robbins, Hank Snow, Flatt and Scruggs, Merle Travis, Merle Haggard, George Jones, Johnny Cash, Loretta Lynn, Willie Nelson, Dolly Parton, and Lucinda Williams.

Though not quite as popular as it once was, country remains a powerful force in the mainstream of popular music.

THE DEEP CONNECTION BETWEEN SCIENTISTS AND COUNTRY MUSIC SINGERS: LUXURIANT FLOWING HAIR

As we all know, many female country music singers flaunt their luxuriant flowing hair. Especially in the presence of bald male admirers. Shameful, but true.

Like country music singers, some scientists cannot resist the seductive appeal of luxuriant flowing hair. They even have their own secret society, the Luxuriant Flowing Hair Club for Scientists:

www.Improb.com/Projects/Hair/Hair-club-top.html

Yes, it's shocking. Shocking.

However, we must remember that scientists occasionally behave like regular humans. For instance, they go to scientific conferences in exotic locales such as Paris and Dodge City and get plastered, just like regular people. And, yes, an undisciplined few pull on mullet wigs (those who don't have natural mullets) and dance on table tops and smash their empty glasses into the fireplace and say inappropriate things in loud voices to their colleagues from France and Brazil and regret it all in the morning. Just like the rest of us.

2.6.12 GOSPEL ("GOSPEL BLUES"), CA. 1930 - PRESENT

African American gospel music started as the spiritual songs of plantation slaves, songs that sounded distinctly unlike the gospel songs heard in white churches, which grew out of Anglo-American hymns.

Once the blues had become established in the north, especially Chicago, African American gospel music and the blues blended into the animated, passionate, melodically embellished style of today's African American gospel music.

Rev. Thomas Andrew Dorsey (1899 - 1993) of Chicago, the seminal figure in establishing gospel blues as a distinct genre, claimed he had coined the term "gospel song" in the late 1920s. Not true. As far back as the 1870s, P. P. Bliss had published collections of songs in books that had the phrases "Gospel Songs" and "Gospel Hymns" in their titles.

Nevertheless, Rev. Dorsey, a one-time secular blues artist, deserves full credit for founding modern African American gospel music in the 1930s. Dorsey fused his lively, improvised, syncopated blues musical style with evangelical lyrics to create an important musical genre.

Probably the greatest interpreter of gospel music was Mahalia Jackson (1911 - 1972), who, in the early part of her career, worked with Rev. Dorsey.

2.6.13 SWING, 1935 - 1946

Origins

Jazz bands grew bigger and bigger in the 1920s and 1930s. Big band music became its own style of jazz.

Swing was actually a short-lived dance music *era* (sometimes called the *big band era*), not a style or genre of music. It began in 1935.

Breakout

Big band arrangers orchestrated many Broadway tunes for their swing orchestras. Audiences went crazy for dancing to big band music. By the late 1930s, swing was king, and Benny Goodman was the king of swing. He pioneered mixed-race big bands.

Crest

The swing era crested in the first half of the 1940s. Then, with the end of World War II, swing abruptly fizzled out. The big bands broke up and by 1946, the swing era was over for good. Jazz, however, continued on as a mainstream musical genre.

Although swing was more a dance era than a genre of music, it is represented on the GSSL as a "genre" simply to emphasize the impact of the 11 years of the swing era in popular music. Swing marked the height of the jazz age, when jazz was the most popular of all the American popular music genres. Many songs of the swing era became standards.

Bands of the swing era introduced electric guitars and big drum sounds that found their way into club-centred music. These sounds became important elements of R & B. A typical swing band consisted of five saxophones, four trumpets, four trombones, piano, bass, drums, often rhythm guitar, and, later in the era, a singer, the most celebrated—deservedly—being Frank Sinatra.

2.6.14
R & B/SOUL, CA. 1945 - PRESENT

Origins

In the 1920s and 1930s, many African American folk-blues musicians migrated to the big cities of the north and found themselves getting drowned out when playing in the rowdy bars.

What to do? Put down the acoustic guitar and pick up an electric one (invented in the 1930s and widely used in the Swing era). Get a good microphone and P. A. system. Get some loud horn players and a drum kit. Big bands had all of these components.

Breakout

By the late 1940s, electrified urban blues (African American pop music) had become a new mainstream genre. *Billboard* magazine labelled it *rhythm & blues* in the late 1940s, later shortened to *R & B*.

Still, white racist fears of African American "sexualized" music and lyrics kept R & B records on the sidelines, while sanitized covers by white artists such as Pat Boone climbed the charts and made piles of money.

Crest

In the 1950s, gospel singers began writing and singing songs in the gospel blues style but with secular R & B lyrics—a reversal of what Thomas A. Dorsey had done in creating modern gospel music a generation earlier. Gospel blues style with secular lyrics came to be called *soul music*.

R & B and soul music crested in the 1960s.

Mainstream Genre

Some of the leading songwriters and performers in the R & B/soul genre: Sam Cooke, Otis Redding, Fats Domino, Holland, Dozier, and Holland, Marvin Gaye, Jackie Wilson, Al Green, James Brown, Ray Charles, George Clinton, Smokey Robinson, Aretha Franklin, Curtis Mayfield, Van Morrison, and Stevie Wonder.

R & B/soul fell off somewhat in popularity with the dominance of rock/pop in the 1970s, but had a resurgence in the 1990s, concomitant with the rise of hip-hop.

2.6.15 ROCK/POP, 1954 - PRESENT

Origins

In the mid 1950s, R & B mashed up with country, resulting in a new genre, initially called rockabilly, then rock 'n' roll, then rock. The early greats of rock were both African American (Bo Diddley, Little Richard, Chuck Berry) and white (Bill Haley, Elvis Presley, Buddy Holly).

Cleveland DJ Alan Freed, who dared to play R & B on a white radio station in the early 1950s, popularized the term "rock 'n' roll."

Breakout

Although Bill Haley had some success with "Rock Around The Clock" and other seminal rock singles, Elvis Presley's astonishing talent and star power vaulted rock to the forefront of popular music in just a few years, starting in 1956.

Some racist white people, fearing further undermining of white authority inherent in African American based music and lyrics, staged record-smashing and burning events.

Crest

Rock crested in the 1970s, then began a slow decline as two new African American genres emerged, dance/electronica and hip-hop.

Mainstream Genre

Rock has been so popular for so long that it's unlikely to run out of steam any time soon.

The term "pop music" usually refers to light, safe, sanitized ultra-commercial rock.

2.6.16 REGGAE, 1968 - PRESENT

Origins

Reggae has roots in several Afro-Caribbean genres, notably calypso (Trinidad and Tobago), mento, ska, and rocksteady (Jamaica).

For a few years in the late 1950s and early '60s, calypso became quite popular outside the Caribbean, thanks to Harry Belafonte and a few other artists who introduced calypso to North American and UK audiences. But calypso did not become established as a mainstream genre outside of the Caribbean.

In the late 1960s, another genre did take hold beyond the Caribbean, a slowed-down and somewhat altered style of ska, known as *reggae*.

Breakout

"Do the Reggay" (early spelling) by Toots & The Maytals, released in 1968, marked the breakout of reggae, much as "Rapper's Delight" in 1979 marked the breakout of hip-hop.

Not long after, Bob Marley and The Wailers took the world by storm.

Crest

Reggae crested in the 1970s, Marley's brilliant decade. He died of cancer in 1981 at the age of 36.

Mainstream Genre

Reggae and related genres such as ska remain popular and influential in mainstream Western popular music.

2.6.17
DANCE/ELECTRONICA, 1975 - PRESENT

> God had to create disco so that I could be born and be successful.
> —DONNA SUMMER

Origins

The culture of DJs playing records in clubs for dancing patrons dates to the 1930s. In parts of Europe, where jazz was banned at the time, jazz lovers established underground clubs where they could play jazz records and dance to the music.

By the 1960s, discotheques, having spread from Europe to America, had sprung up all over, in cities large and small. In New York in the late 1960s and early '70s, African American and gay clubbers kept demanding funky R & B and soul tracks to dance to.

Bands responded by releasing records that emphasized "four on the floor" bass drum and relentless thumping electric bass, set against swirling synth strings.

Breakout

Dance/electronica as a musical genre broke out in the mid-1970s with the release of numerous disco classics, such as "Love To Love You Baby," "Disco Inferno," "Lady Marmalade," "Kung Fu Fighting," and "Dancing Queen."

Inevitably, there was a backlash against disco in 1979, partly fuelled by racism and partly by homophobia (faggy and unmasculine, they sneered). Disco reactionaries burned records, as had happened in the racist backlash against rock, a generation earlier.

Although the popularity of disco declined (but did not disappear), other sub-genres sprang up from the club dance scene, and, over time, dance/electronica became a musical genre in its own right, not just a dance fad.

Crest

Dance/electronica probably crested in the 1990s, the heyday of numerous electronic sub-genres, some of which had emerged in the 1980s, such as techno (Detroit), house (Chicago), drum 'n' bass, trip-hop, and scores of others.

Mainstream Genre

Dance/electronica artists continue to experiment and innovate. The clubs rave on.

2.6.18 HIP-HOP, 1979 - PRESENT

Origins

Modern hip-hop represents a genre that has come full circle. It's as popular today in its African homeland as it is everywhere else in the world.

Hip-hop originated centuries ago in West Africa with the advent of *griot* (pronounced GREE-oh) culture. Today, as in the past, the Wolof griots of Senegal dance, recite poetry, narrate epics, and play percussion instruments such as drums and clappers. Their function is to impart stimulation and energy to governing nobles.

The slave trade brought the griot oral tradition to the Caribbean and the American continents.

Modern hip-hop's immediate precursor was Jamaican *sound system culture*—dance parties featuring DJs (rapping over the music) and *toasters* (rappers).

Some Jamaican DJs, notably Kool DJ Herc, emigrated to America (Brooklyn) and brought sound system culture with them.

In the 1970s, hip-hop musicians introduced several key innovations, such as separation of the roles of DJ and MC, breakbeat DJing, and scratching.

Breakout

Traditionally, hip-hop refers to the so-called "four elements" of African American urban culture that first emerged in New York in the 1970s, namely, rapping (MCing), scratching (DJing), break dancing, and graffiti art. It's more accurate to refer to the musical genre as "hip-hop" instead of "rap" because some hip-hop artists:

- Rap, but don't sing
- Sing, but don't rap
- Rap and sing
- Incorporate DJing in their act
- Don't have DJing in their act

and so forth.

In 1979, several rap records, especially "Rapper's Delight," became popular nationally, marking the breakout of hip-hop. Within a decade, hip-hop had swept the world.

Crest

Hip-hop, yet another genre created by African Americans, has not crested yet, and probably won't for some years.

Hip-hop is only the latest in a string of African American popular music genres to have gone global.

WHITE RAP: TALKING BLUES

> ***Rap*** *n. A style of popular music characterized by rhythmic recitation of rhymed lyrics to music with a pronounced beat or rhythm.*

If you accept the above as a fair definition of rap, then *white guys* independently created a genre of rap *decades before* the advent of hip-hop.

More irony: white rappers were southerners who played *country music*—probably the most reviled music among today's hip-hop artists and fans. Not only that, the white rappers co-opted a black-created musical idiom for their backing track: the 12-bar blues form. Eventually, white *folk* musicians co-opted white rap and turned it into a genre associated with leftist protest and social justice causes—anathema to many if not most white southerners, who created white rap in the first place.

How did all this happen?

In 1927, a pipe-smoking country singer-songwriter from South Carolina named Christopher Bouchillon had written a country-blues song and played it for his record producer who liked the

lyrics but couldn't stand Chris's singing. So he directed Chris to *talk* the lyrics while playing guitar in his usual rhythmic up-tempo style. So he did. The record was called "Talking Blues," and it became a national hit. The year was 1927.

Soon, bunches of other country acts got on the bandwagon and recorded their own talking blues records. In the 1930s, one guy named Robert Lunn even billed himself professionally as "The Talking Blues Man" and popularized the new genre on the Grand Ole Opry.

Then the great folk singer-songwriter Woody Guthrie started writing and performing talking blues with decidedly left-wing, pro-labor messages, such as "Talking Dust Bowl Blues," "Mean Talking Blues," and "Talking Subway."

In no time, folksingers all over the United States—Pete Seeger, John Greenway, Rambin' Jack Elliot—and overseas (Lonnie Donegan, the Scottish skiffle pioneer, for instance) were writing and performing talking blues songs.

Bob Dylan, who idolized Woody Guthrie, began writing talking blues songs early in his career. One of his best, "Talkin' World War III Blues," was first released on the album *The Freewheelin' Bob Dylan* in 1963. If you want to hear what it sounds like and read the lyrics, go to www.BobDylan.com and click on "songs."

Another of Dylan's great talking blues tunes got censored for political reasons. In 1963, Ed Sullivan invited Dylan to play a song on his wildly popular television show. A fantastic opportunity. It was *The Ed Sullivan Show,* after all, that had introduced The Beatles, Elvis, and many other rock and pop acts to tens of millions of Americans and Canadians.

Dylan agreed to appear on *The Ed Sullivan Show* if he could perform a new talking blues tune called "Talkin' John Birch Paranoid Blues." Well, when the *Ed Sullivan Show* people heard it, they told him he could perform another song, but not *that* one. Apparently, the *Ed Sullivan Show* people didn't want to offend the John Birch Society, an organization of ultra right-wing extremists (which still exists today). So Dylan told them to stuff it. He never did appear on *The Ed Sullivan Show*.

By today's standards, this would be the equivalent of refusing the opportunity to appear on the Super Bowl half-time show. This no doubt baffles a lot of acts of dubious integrity, who would do *anything* to play for an audience of that size. Even sing the company song of Enron or Haliburton. Dylan's record company pulled "Talkin' John Birch Paranoid Blues" from *The*

Freewheelin' Bob Dylan before they released the album. Fans who did not hear a bootleg tape of the song had to wait until 1991, when an early live recording was finally "officially" released on the album *The Bootleg Series*. You can hear the song and read the lyrics at www.BobDylan.com.

The talking blues genre lives on in folk music circles, although it's not terribly popular. Nevertheless, although it's not known officially as "rap," talking blues fits the definition precisely: "a style of popular music characterized by rhythmic recitation of rhymed lyrics to music with a pronounced beat or rhythm."

Although "white rap" antedates modern "black rap" by some 50 years, no evidence exists that talking blues had any influence whatsoever on the African-American rap pioneers of the 1970s. Which means that white rappers and black rappers each came up with the rap genre independently. Which happens with great ideas from time to time. Newton and Leibnitz developed the mathematical branch called the calculus independently of each other. Darwin and Wallace independently discovered evolution by natural selection.

2.6.19
WORLD MUSIC, 1982 - PRESENT

There's no general agreement on what the term "world music" means exactly, except that it refers to folk music. World music used to refer to the indigenous music of developing or third world nations. However, a more accurate definition would include the folk music of all nations whose people, whether indigenous or colonizing, don't share the language of one's own nation.

For example, Australians or Canadians would consider the folk music of developed countries such as Spain or Portugal to be "world music." And vice-versa.

The name "world music" may have originated with the first WOMAD festival (the World of Music, Arts and Dance), organized by Peter Gabriel and others, which took place in England in 1982. The proliferation of WOMAD festivals fired the musical imaginations of some Western pop musicians who began to incorporate elements of the traditional music of other nations into their own music.

One of the most famous and successful "world music" albums by an English-language artist is Paul Simon's *Graceland* (1986).

So much for biological and historical context. On to the nitty gritty of technique. Yee-ha.

Part II

Essential Building Blocks of Music

3

How Tones and Overtones REALLY Work

All music—whether folk, pop, symphonic, modal, tonal, atonal, polytonal, microtonal, well-tempered, ill-tempered, music from the distant past or imminent future—all of it has a common origin in the universal phenomenon of the harmonic series.

—LEONARD BERNSTEIN

3.1 Tones and Their Properties

3.1.1 "Anything You Can Do"

As discussed in Chapter 1, humans use discrete pitches, or discrete *tones*, in both speech and music, unlike the sliding vocalizations of most primates.

A music dictionary will tell you that a tone (or note) is a sound of a definite *pitch*. And a pitch? A tone.

Not terribly helpful.

The truth is, you can use words to describe a tractor or a tiger lily or a tuba. But not a tone. Like that other critical element of music, *time*, tone defies verbal description because it's a phenomenon you perceive with one of your senses. You *sense* tone, just as you sense color, odour, taste, and touch.

You have to actually hear a tone to understand what a tone is. Once you know what a tone is, you can get to know its properties.

DON'T GET LOST BETWEEN TONES

Potential Point of Confusion: The term *tone* has several different meanings in music. Here in Chapter 3, *tone* and *overtone* refer to the musical sound sensations your brain processes when a string or membrane (such as your vocal folds) or column of air vibrates.

When you get to Chapter 4, the term tone will refer to something completely different, namely, the *pitch distance* between two notes.

If you don't understand the distinction, you will get lost. And then Marshal McDillon will have to organize a search party to fetch you back from the wilderness. Which he doesn't want to have to do because the whole search party might get lost, and horses aren't much good at getting their bearings straight. And, of course, as in any Classic Western, global positioning systems haven't been invented yet.

Irving Berlin inadvertently wrote a song about tone properties, called "Anything You Can Do (I Can Do Better)," a duet between Annie Oakley and Frank Butler, from the 1946 musical, *Annie Get Your Gun*. If you haven't heard this excellent song, look up the details at www.GoldStandardSongList.com. Have a listen to it at one of the music download services such as iTunes or PureTracks.

3.1.2 PITCH: "I CAN SING ANYTHING HIGHER THAN YOU"

Here's the tone property *pitch*, as Annie and Frank explain it:

Any note you can reach, I can go higher.
I can sing anything higher than you.
(High) No you can't.
(Higher) Yes I can.
(Higher) No you can't.
(Higher) Yes I can (etc.)

As creatures with keen visual imaginations, humans like to convert the properties of tones into visual metaphors, like this:

Pitch = "height" of sound

We all use expressions such as "high pitched" and "low pitched." A tune goes "up" and "down" as it steps from tone to tone.

VISUAL METAPHORS: THE HEIGHT, DEPTH, AND LENGTH OF SOUND

Sonic Height

So, if the sound equivalent of the visual perception of *height* is *pitch*, what's the sound equivalent of *depth*? And what's the sound equivalent of *length*?

Sonic Depth

The sound equivalent of the visual perception of *depth* is *harmony*, the subject of Chapter 6. A group of related tones played simultaneously—a chord, in other words—gives sound a 3-D depth-like quality. As you'll see in Chapter 6, tones more related to each other provide a clearer sense of sonic depth than tones less related to each other. Completely unrelated tones blur off into noise, the sound of the wind in the poplars or Niagara Falls.

Sonic Length

The sound equivalent of the visual perception of *length* (or width, if you prefer) is *beat* or *rhythm*, the subject of Chapter 7. Beat measures time, the duration or *length* of a piece of music. Metaphorically, when you listen to a song, you go on a train trip. You go up and down hills (melody) and travel though a three-dimensional landscape (harmony). The "length" of the train trip

depends on the *total number of beats* (the clickity-clack of the rails) and the *speed* of the train (tempo).

Everybody talks about the time dimension of music in terms of how "short" or "long" it is. Music notation visually captures the train trip as a one-way, left-to-right, measure-by-measure, ever-changing series of symbols embedded in five-rail train tracks called the *staff*.

Some people have *absolute pitch,* informally called *perfect pitch*. A rare skill. If you have it, you can name a particular note without reference to any other sound.

For example, if you had absolute pitch, someone could blindfold you, then play any single note on a piano or other instrument. You would be able to identify the exact note:

"That's F sharp, two and a half octaves above Middle C."

An extraordinary few with absolute pitch can even hum an exact note on demand, *without even hearing it played*:

"Hum E below Middle C."

"Okay. Hmmmmmmmmmmmm."

"Dang, you're good!"

To acquire absolute pitch, you need training as a young child, during a critical period of roughly 3 to 6 years. Also, it appears you need a particular gene variant. If you don't have both—training during the critical period and the genetic endowment—you won't acquire absolute pitch.

Hardly anybody has absolute pitch, although many claim to, as if it confers musical superiority.

Fortunately, absolute pitch has little practical value for musicians. If you don't have it, you're in good company. Composers such as Tchaikovsky and Wagner did not have it, yet did pretty well.

This is only a guess, but it's unlikely Lou Reed has it, or Kris Kristofferson. Or William Hung.

THE LOWEST NOTE IN THE UNIVERSE

A huge pipe organ can produce *infrasound*. An infrasound frequency is so slow that it sounds like a gigantic cat purring. You *feel* the sound it more than you hear it. (When it stops purring, you worry.)

In nature, tornados and storms generate infrasound.

But if you want the most "infra" of infrasound, you have to listen to the stars. Some clever astronomers claim to have discovered the lowest note in the universe. It's coming from a black hole in the Perseus galaxy cluster, roughly 250 million light years from earth.

And what is that note, exactly?

Why, it's B♭, 57 octaves below the B♭ nearest Middle C on the piano.

If you wanted to duplicate that B♭ here on Earth, you'd have to build a gigantic piano. If you succeeded in building a big enough piano, and then you hit that low B♭, you'd have to wait 10 million years for the first sound wave to complete its cycle. And, of course, you wouldn't be able to hear the sound because it would be about 53 octaves below the threshold of human hearing.

3.1.3 LOUDNESS: "I CAN SAY ANYTHING SOFTER THAN YOU"

Annie and Frank on the tone property *loudness*:

Anything you can say, I can say softer.
I can say anything softer than you.
(Soft) No you can't.
(Softer) Yes I can.
(Softer) No you can't.
(Softer) Yes I can (etc.).

Like most people, you probably refer to loudness as *volume*. As in the "volume" control on your radio or remote. You experience loudness subjectively as sound intensity. The louder the sound, the more intense it seems.

You may have a sound system with both a "volume" control and a "loudness" control. That loudness control does something quite different from the volume control. The loudness control compensates for a natural pitch bias that everyone has. As a human, your hearing system evolved to hear *mid-pitched sounds*—the pitches of human speech—as *relatively louder* than bass and treble pitches. In short, you're born with a hearing mechanism that's more sensitive to mid-pitched sounds. Especially at a relatively *soft* volume level, you don't hear extremes of bass and treble nearly as

well as you hear mid-pitched sounds. So, when you listen to music at soft volumes, the music seems to lack adequate bass and treble.

To compensate for this, the loudness control boosts both bass and treble, but not the middle pitches. With the loudness control engaged, you can listen to music at a soft volume level, but still hear the bass and treble pitches at satisfactory levels. As you turn up the volume (increase overall sound intensity), your sensitivity to middle pitches lessens, relative to bass and treble. So you can cut back on the artificial boost of the loudness control—unless you happen to like bass-heavy and treble-heavy music.

Loudness as a property of tone has no obvious visual analog, except, perhaps, the offensive, garish appearance of colorful, "loud" clothes. That metaphor doesn't really apply to music, though. Loud music ain't (necessarily) garish and offensive. You seldom hear anyone saying, "Turn it down, it's as loud as a fluorescent Hawaiian shirt!"

Like pitch and the other properties of a tone, loud sound and quiet sound elicit different kinds of emotions. More on this in a while.

3.1.4 DURATION: "I CAN HOLD ANY NOTE LONGER THAN YOU"

Annie and Frank:

Any note you can hold, I can hold longer.
I can hold any note longer than you.
No you c - a - a - n - 't.
Yes I c - a - a - a - a - a - n.
No you c - a - a - a - a - a - a - a - a - n - 't.
Yes I c - a - a - a - a - a - a - a - a - a - n (etc.)

Usually, duration refers to the length of time a *single* pitch sounds, as in a "short" note or a "long" note—the sound equivalent of visually-perceived *length*, as discussed above. But you can also perceive a unity of duration when you hear multiple pitches, as, for instance, when you hear a sung syllable that stays the same but varies in pitch:

"Oooo-oooo-oooo-oooo-oooo-ooooh, baybah"

where each group of "ooohs" represents a different pitch. The musical term for this is a *melisma*. You hear a lot of melismas (sometimes pluralized *melismata*) in highly expressive genres such as R & B, gospel, soul, and certain species of country music.

3.1.5 TONE COLOR: "I CAN SING ANYTHING SWEETER THAN YOU"

Annie and Frank demonstrate tone color like this:

Anything you can sing, I can sing sweeter.
I can sing anything sweeter than you.
(Sweetly) No you can't.
(Sweeter) Yes I can.
(Sweeter) No you can't.
(Sugary) Yes I can (etc.).

WHAT DID THE BIG BANG SOUND LIKE?

As you know, the particular universe we allegedly live in (perhaps one of zillions of parallel universes) started with a big bang, 13.7 billion years ago. If someone had thought to set up a microphone and maybe a cassette recorder (or whatever the prevailing recording technology was back those days) to tape the event, what would it have sounded like?

John Cramer of the physics department at the University of Washington, has re-created the sound of the big bang, just for you. It's not exactly a "bang"—it's more a like the sound of a chorus line of 100,000 bass crickets in top hats. The sound gradually builds to a crescendo, then gradually fades away. If you listen closely, you can hear the faint tenor of a lone cricket, singing "When you wish upon a star ... "

Here's the big bang sound link:

www.NPL.Washington.edu/av/altvw104.html

Why does a gruff voice sound different from a sweet voice? You can easily tell one from the other when each voice sings, in turn, the same pitch at the same loudness level for the same duration.

Why does a guitar sound "different" from a piano, even when you play exactly the same note on each instrument?

Before getting into the "why" of tone color, a little bit on the subject of *acoustics*.

3.2
Overtones: The Harmonic Series

3.2.1
THE TONE PATH TO YOUR BRAIN

Acoustics is the study of sound and its transmission.

When you pluck a string of an acoustic guitar to initiate a tone, here's what happens:

- The string vibrates really fast. Hundreds of times per second. So fast that your eye can't follow the movement.

- The vibrating string connects to the body of the guitar via the *bridge*. This enables the vibrating string to set the body of the guitar flexing back and forth at the same *frequency* (number of vibrations per second) as the vibrating string.

- When the guitar body flexes one way, it compresses the air molecules that surround it (*compression*). When it flexes the other way, the air pressure drops (*rarefaction*). As the guitar body flexes back and forth, the compression and rarefaction of the surrounding air particles repeats itself over and over. And over and over. Really fast.

- As a result, spherical pulses—*pressure waves*—of air particles radiate outward in all directions from the flexing guitar body. Really fast. These pulses—not the air itself!—move through the atmosphere at 743 miles an hour, the *speed of sound*. (In Canada, that's 1,188 km per hour, which seems faster than in America, probably because of the cold, crisp Canadian air.)

- The tone travels as a pressure wave through the air until it hits your ear drum. At that point, it transmogrifies into mechanical motion, setting your ear drum vibrating, just like the diaphragm inside a microphone.

- And then those three teeny bones in your middle ear get into the act. Remember the "hammer, anvil, and stirrup" from elementary or middle school? Smallest bones in your body.

- Finally, your inner ear transduces the vibrations into nerve impulses. The nerve impulses then travel to a number of different parts of the brain, each

specialized to analyse a specific element of the sound, some related to pitch (tones, intervals, chords), some to time (beat, pulse, tempo meter, rhythm).

At this point, your brain interprets your original plucking of the guitar string as a *tone*. Or, if you're British, a *note*.

The whole process happens so fast it seems instantaneous. You pluck the guitar string, you hear the corresponding tone or note instantly.

If you're listening to a song, depending on how well crafted the tune is, you may then experience an emotional reaction as your brain processes the music.

Being a parallel processor, your brain easily and automatically handles all the different sound processing tasks simultaneously.

Your brain may look up tones in a neural dictionary. The cortex of marmoset monkeys contains pitch-sensitive neurons, that is, neurons that actually code for pitch. These nerve cells respond to specific frequencies, which means that if the same holds true for humans (it's likely), then the human brain stores a vocabulary or dictionary of different pitches, the way the brain stores a vocabulary of words.

3.2.2 A HOUSE IS NOT A HOME, AND A TONE IS NOT A TONE

So, that's what happens when you hear a tone (or note).

Or is it?

Music—as distinct from sound—begins, not with tones, but with something called *harmonics* or *overtones* (these two terms mean the same thing) and their role in the construction of *scales* (the subject of Chapter 4).

When you play the note "Middle C" on the guitar (B string, first fret), the string vibrates 261.6 times per second (assuming you've tuned your guitar), or 261.6 *cycles per second*. Also called 261.6 *Hertz*, after physicist and wave theory pioneer Heinrich Rudolf Hertz. Also abbreviated 261.6 *Hz*.

The vibrating string sets the body of the guitar pulsing at the same frequency, 261.6 Hz.

When you play the same note, Middle C, on the piano, a hammer hits some strings attached to the sound board inside the piano, which starts vibrating at the same frequency, 261.6 Hz.

You hear the same note, Middle C, on each instrument. Yet, you can easily tell the sound of the guitar from the sound of the piano.

How come?

The answer has to do with tone color. The technical term for tone color is timbre (pronounced, TAM-ber, unless you know proper French). It's a function of harmonics, or overtones.

3.2.3 SO, WHAT EXACTLY ARE HARMONICS/ OVERTONES?

Try this little experiment:

Grab your guitar again. Acoustic or electric, it doesn't matter. If it's electric, plug it into an amp and crank it a bit. If you're a keyboard player, borrow a guitar.

If you don't know how to play guitar, that's okay—you don't have to know how to play to do this:

- Tune the high "E" string down to "C" (Middle C). (Never mind why Middle C is called Middle C. Or why it vibrates at 261.6 Hz instead of some nice round number like 250. That's coming up in a bit.)

- Now pluck the string. When you do this, you set the whole string vibrating at 261.6 Hz.

- If you look closely, you can observe the string blur, immediately after you pluck it. The blurring becomes less intense as the note dies away.

Whether you realize it or not, when you pluck the string, at the same time as the string vibrates at 261.6 Hz, the string also automatically divides itself in half. The two halves vibrate at exactly twice the frequency, 523.2 Hz. You can't see this—the string vibrates way, way too fast for the naked eye to see. You observe only a blur.

This secondary high-speed vibration, at a frequency of 523.2 Hz, also produces a tone, of course. But that tone has a considerably higher pitch than Middle C. The secondary tone is called a *harmonic* or *overtone*.

A harmonic or overtone has two properties:

1. It's higher in pitch than the original (261.6 Hz) tone, and
2. It's way softer in volume than the original (261.6 Hz) tone.

Now, with overtones in the picture, the original tone needs a name to distinguish it from the overtones. That name is the *fundamental*. You can think of the fundamental as the primary tone, and the overtone as secondary, because it's softer.

The overtone is so soft that the much louder sound of the full-length string vibrating at 261.6 Hz, the fundamental, drowns out the overtone. (In a few situations—when playing an electric bass, for example—an overtone can sound louder than the fundamental. But that's the exception to the rule.)

3.2.4
NOT JUST ONE OVERTONE—A BUNCH OF 'EM

Now things finally start to get interesting from a musical perspective. That vibrating string, at the same time it divides itself in half, also divides itself into thirds. And quarters. And fifths. And sixths. And so on, and so on, and so on. *All at the same time.*

In other words, the string vibrates in a complex way. The secondary vibrations happen much too fast for the eye to see.

Each of the string-subdivisions produces a *different*, soft, high-pitched overtone. The comparatively loud fundamental drowns out all of them. So it seems that you don't even hear the overtones. But you do. Your brain does process them (coming up in just a moment).

To summarize: a single vibrating string (or other vibrating thing—such as a pair of vocal folds) simultaneously divides itself many times and produces a whole series of soft, high-pitched overtones. Dozens.

3.2.5
THE HARMONIC SERIES (OVERTONE SERIES)

If you have the right equipment, you can identify and measure all the overtones present when you pluck a single guitar string and produce Middle C. The frequencies of all the dozens of overtones turn out to be simple whole-number multiples of the fundamental.

Taken together, the fundamental and all the overtones are called the *harmonic series* or the *overtone series* (these two terms mean the same thing).

Table 4 below shows the frequencies of the first 15 overtones of Middle C. It's important that you sit down right now and memorize every single number in the "Frequency" column.

(No, wait! It's not important.)

TABLE 4 Fundamental and First 15 Overtones of the "Middle C" Overtone Series

Tone / Overtone	Multiple of Fundamental	Frequency (Hz)
Fundamental	1 (f)	261.6
1st Overtone	f x 2	523.2
2nd Overtone	f x 3	784.8
3rd Overtone	f x 4	1,046.5
4th Overtone	f x 5	1,308.0
5th Overtone	f x 6	1,569.6
6th Overtone	f x 7	1,831.2
7th Overtone	f x 8	2,093.0
8th Overtone	f x 9	2,354.4
9th Overtone	f x 10	2,616.0
10th Overtone	f x 11	2,877.6
11th Overtone	f x 12	3,139.2
12th Overtone	f x 13	3,400.8
13th Overtone	f x 14	3,662.4
14th Overtone	f x 15	3,924.0
15th Overtone	f x 16	4,186.0

These are just the first 15 overtones—they continue on and on, ever higher in pitch, ever softer. The next overtone in the series above would be the 16th overtone, with a frequency 17 times that of the fundamental, or 4,447.2 Hz.

3.2.6 YOUR BRAIN'S AUTOMATIC TONE-PROCESSING SKILL

Although you think you only hear Middle C, (the fundamental, at 261.6 Hz), your brain sort outs all the overtones. Automatically. Without the slightest conscious effort on your part. A miraculous feat of naturally-selected engineering.

Any note you play on any musical instrument is *named for the fundamental*, even though each note comes with a bunch of overtones.

Your brain has evolved mechanisms to identify harmonic relations. It breaks a tone into its various harmonics or overtones, analyses them, then puts them back together to identify the sound as a specific tone (as opposed to random noise).

Because the separate harmonics are related to each other in simple frequency multiples (Table 4 above), the brain understands that a *single soundmaker* must be producing them. The necessity of identifying soundmakers probably drove the evolution of the brain's naturally-selected ability to parse a tone into its overtones. In Palaeolithic times, having the capacity to tell the difference between an owl's hoot and a lethal predator's growl would have saved you from getting eaten.

The harmonic series is sometimes known as the *chord of nature*, because it's not cultural in origin; it's a phenomenon of nature. Any tone, whether coming from a musical instrument or not (e.g., pinging a wine glass), consists of a fundamental plus a batch of overtones that are always related to the frequency of the fundamental as integer multiples of the fundamental.

HOMING IN ON THE HUMAN HEARING RANGE

The range of human hearing spans roughly 20 Hz at the low end to 20,000 Hz at the high end. That means your brain does not respond to tones or overtones with frequencies lower than 20 Hz or higher than 20,000 Hz.

Of all the common acoustic musical instruments in the world, the piano has the widest frequency range. Its 88 keys span a range of 27.5 Hz to 4,186.0 Hz.

What do you hear when you plink that last, highest key of the piano? You hear the fundamental tone at 4,186 Hz, and your brain also picks up and processes the first few overtones. But only the first few.

Recall that overtone frequencies are always whole-number multiples of the fundamental. So the first overtone of the highest note on the piano has a frequency of 8,372 Hz. The second overtone, 12,558 Hz. The third overtone, 16,744. Your brain probably does not process the fourth overtone—it's too high.

The highest key of the piano actually produces dozens of overtones, but your brain does not react to any of the ones with pitches higher than about 20,000 Hz.

Suppose, by accident or disease, your hearing became restricted to, say, 5,000 Hz at the high end. Would you still be able to hear every note on the piano? Yes, you would. But the instrument would sound muffled, lacking in treble. That's because your brain would not be able to process the rich array of overtones in the 5,000 to 20,000 Hz range.

Roedy Black's *Musical Instruments Poster*, available at www.CompleteChords.com, shows the pitch ranges of more than 70 musical instruments and six vocal ranges. The *Musical Instruments Poster* organizes the information by note and by frequency, including the frequencies of each of the 88 notes of the piano.

3.2.7 BRING OUT THOSE OVERTONES!

Normally, you do not hear overtones directly, the way you hear fundamentals. But you can hear for yourself what overtones sound like.

Try this (if you're a guitar player, you probably know how to do this):

- If you're right-handed, pluck the guitar string—the one you tuned to Middle C a few minutes ago—with your right hand. At the same time, with any finger of your left hand, lightly touch the vibrating string just over the 12th fret (over the metal fret itself, not the space between frets).
- What you now hear is a high-pitched note. You have "exposed" the sound of the first overtone by damping ("killing") the sound of the fundamental. You have effectively cut the string in half, and you can hear both halves vibrating at the same frequency. What you're hearing is the first overtone of Middle C, vibrating at double the frequency of Middle C.
- The point at which you *damped* (muffled) the fundamental using your finger is called a *node*. You can clearly hear the overtone, even though it sounds softer than the fundamental was before you damped it.
- Pluck the string again, but this time, lightly stop the string over the seventh fret. Now you hear a completely different overtone. It's even higher-pitched than the first one. And it's softer. It's the second overtone.
- Pluck the string again. This time, lightly stop the string over the fifth fret. Yet another, even softer overtone. So soft, you can barely hear it. The third overtone.

You can keep doing this, teasing out even higher, fainter overtones.

ANOTHER WAY OF EXPOSING OVERTONES

Next time you have access to an ordinary acoustic piano (upright or grand), try this:

- Lightly press down on Middle C, and also on the E and G immediately above Middle C—so lightly that the hammers do not hit the strings.
- Hold down the three keys. The strings associated with Middle C, E, and G are now undamped and free to vibrate.
- With your left hand, hit the note C below Middle C. Give that key a short, hard, quick, unsustained "bonk."

The vibrating strings of C below Middle C cause the sound board to vibrate only for the brief duration of the "bonk." However, the C-below-Middle-C bonk sets the open strings of the three keys you are holding down into sympathetic vibration. This causes the soundboard to vibrate and produce sound waves at the same frequencies as some of the overtones of C below Middle C. So that's what you hear—a series of faint *harmonics* of C below Middle C.

3.2.8 OVERTONES IDENTIFY MUSICAL INSTRUMENTS AND VOICES

When you play a single note on any musical instrument, the note consists of a fundamental tone plus a whole series of *simultaneous* overtones. No matter what the instrument is. Not only that, it's the *same* group of simultaneous overtones, regardless of the musical instrument.

So, if it's the same group of overtones, why does a guitar sound different from a piano when you play Middle C on each instrument?

Because the loudness (volume) of each individual overtone is *different* for each type of instrument, depending on the instrument's shape, size, construction, etc.

Your brain's evolved music-processing modules instantaneously analyse the varying loudness levels of the overtones and accurately sort out which overtone series belongs to which instrument.

Each instrument produces its own "overtone signature"—its own characteristic array of relative loudness levels of each overtone. That's what gives rise to an instrument's unique tone color or timbre. And that's why you can instantly differentiate the sounds of numerous musical instruments.

Your brain can do this for all manner of different sound sources, not just musical instruments. Practically any source of sound. They all produce overtones, each with its own characteristic overtone signature.

Your voice and all other human voices have unique overtone signatures. You can easily tell different human voices apart, even when you can't see who's talking or singing. This capability of the human brain makes possible industries such as radio broadcasting and sound recording.

3.3 How Musical Instruments Work (Including the Voice)

3.3.1 WHAT'S A MUSICAL INSTRUMENT, ANYWAY?

The voice was certainly the first musical instrument, followed by percussion instruments, then melodic instruments, then chordal instruments.

Musical instruments are probably as old as modern humans. At least a couple of hundred thousand years old, in all likelihood. Possibly much older.

So, what's a musical instrument?

All musical instruments are resonators, or *resonating machines*. A resonator is a contraption (in this case, all or part of a musical instrument) that vibrates in sympathy with (i.e., as a result of similar vibrations of) another nearby part of the instrument that you set in motion.

So, with most musical instruments (not all, as you'll see), two different things vibrate:

- The initial sound source that you, the musician, set in motion, and
- A resonating body connected to the first sound source.

Any given resonator vibrates more readily or efficiently at certain characteristic frequencies, called *resonant frequencies*, than at other frequencies. Musical instrument designers shape instruments to resonate best at certain frequencies, and damp the others as much as possible. That's why trumpets, French horns, and saxophones are shaped so differently.

A few of the variables that determine the instrument's resonant frequencies and, therefore, the instrument's overall sound, include:

- Size of the instrument
- Shape of the instrument
- Material the instrument is made of
- Internal construction of the instrument

Your brain responds best to the uncomplicated vibrations that simple shapes generate. Simply shaped soundmakers create tones that you can make sense of. If you strip away frets and valves and tuning mechanisms from musical instruments, you find that they have pretty simple shapes compared with other soundmakers in nature, such as your average poplar tree or Niagara falls, which generate noise instead of pure tones.

3.3.2 SETTING RESONATORS IN MOTION, DIRECTLY AND INDIRECTLY

You can get sound out of a musical instrument's resonator in two ways.

1. The Direct Way

You can simply whack it. Clobber, shake, or otherwise beat the dang thing directly. For instance, when you hit a drumhead, causing it to vibrate, you also set the body of the drum (the resonator) vibrating, because it's fixed securely to the drumhead.

- With some instruments, such as cymbals and gongs, you strike the resonator directly. The resonator *is* the instrument.

- With others, such as marimbas, you use mallets to hit tuned wood bars, causing the bars to vibrate. Underneath each wood bar, a resonator in the

shape of a tube vibrates in sympathy, producing a dominant fundamental frequency that you recognize as a specific tone or note.

Instruments such as these—the ones you hit directly—do not sustain sound for long (except for tuned percussion instruments such as the xylophone family, kettledrums, and steel drums). So, if you want to create a continuous stream of sound, you have to keep delivering blows (e.g. a snare drum roll).

2. The Indirect Way

You can set into vibration a certain part of the instrument *other than the resonator*. The part that you set in motion connects to the resonator via an *intermediary* of some sort, which transmits the original vibrations to the resonator, which vibrates in sympathy.

With a stringed or wind instrument, unlike most drums, you can sustain the sound pretty easily. The string or reed that you set in motion has much less mass than the resonator to which it is indirectly attached. So you don't need to deliver too much energy to keep the string or reed or your lips vibrating, and thus the resonator vibrating in sympathy.

(In the case of the flute family of instruments, you blow across a sharp edge. The resulting turbulence creates an *air reed* which sets the column of air inside the flute vibrating, which causes the body of the flute—the resonator—to vibrate in sympathy.)

In general ...

- A *small resonator* (e. g., hi-hat or flute) creates small, fast compressions and rarefactions that your brain perceives as high frequencies of sound—*high pitch*.

- A *large, heavy resonator* (e. g., bass drum or acoustic bass), moves big masses of air, creating big, slow compressions and rarefactions of air molecules which stimulate your ears and finally your brain, which perceives low frequencies of sound—*low pitch*.

3.3.3
CATEGORIES OF MUSICAL INSTRUMENTS

When most musicians think of categories of acoustic musical instruments, three come immediately to mind: strings, winds, and percussion.

That's pretty close to the formal system developed by Erich von Hornbostel and Curt Sachs, which has served as the classification standard since 1914. Their system divides acoustic instruments into four categories:

- *Idiophones:* percussion instruments without a membrane
- *Membranophones:* percussion instruments with a membrane
- *Aerophones:* wind instruments, including the human voice
- *Chordophones:* stringed instruments

An additional category is now generally recognized:

- *Electrophones:* instruments that produce sound electronically

3.3.4
IDIOPHONES: PERCUSSION INSTRUMENTS WITHOUT A MEMBRANE

All cultures have idiophones. But not all cultures have membranophones. Australian aboriginal percussion instruments, for example, consist of idiophones but not membranophones.

It's likely idiophones were the first non-vocal musical instruments. Probably rocks (the first rock music). But knocking two rocks together doesn't make much sound because rocks have too much mass to vibrate and resonate much.

Pieces of wood work better. Bones work even better, especially hollow bones. Hollow leg bones. And skulls. *Human* skulls.

You can make numerous other nifty idiophones from various bones. For instance, you can fashion a rattle using spine bones and a cord.

Idiophones include:

- Rattles
- Cymbals
- Bells
- Xylophones
- Steel drums (they do not have membranes, like other drums)
- Musical saws
- Gongs
- Washboards (yeee-ha!)

PLAYING THE MUSICAL SAW: WHY AND HOW

A few years ago, in an interview with an admiring reporter from the *Dodge City Musical Saw Weekly*, Marshal McDillon explained how and why he plays the musical saw.

"So you've been riding the trail all day, and you finally set up camp and take care of the horses and eat some beans and roast some squirrels. And later on, everybody's sitting around, poking at the fire with willow switches, and somebody pulls out a mouth organ. Or, if nobody has one, then mouth organ music just comes out of thin air and everybody looks at each other, puzzled-like. It's a cliche of every Classic Western, the mouth organ music coming out of thin air around the campfire. You're supposed to act like you don't even hear that mouth organ music.

"Anyhow, when this happens, I just head on over to the chuck wagon and find a hand saw and a fiddle bow.

"I sit down on a log and clamp the handle of the saw between my knees so that the saw points straight up and the teeth face towards me.

"Next, I grab the top of the saw with my left hand and bend it to my left into a 'C' shape, then slightly back at the top so that it makes a slight 'S' shape.

"Then I pick up the bow with my right hand and let 'er rip. When I bow the bent saw, it makes a howling sound. Like a coyote. Or a theremin. No discrete pitches like you get with a piano.

"It's hard to play it good enough so that it doesn't sound like a heartbreakingly lonesome wild animal.

"But I'd recommend to everybody that, before you try this out on the trail, you may wish to practice in the privacy of a dark windowless cellar. Give yourself some time to get the hang of it. Say, four or five years."

3.3.5 MEMBRANOPHONES: PERCUSSION INSTRUMENTS WITH A MEMBRANE

The first membranophone was probably a drum fashioned from an animal skin stretched over something conveniently hollow. Maybe the skull of somebody the drummer didn't particularly like. (If your band has a drummer, watch out.)

Membranophones include:

- Nearly all drums
- Marimbas
- Kazoos, including the venerable comb and tissue paper. New York's Julliard School offers a four-year comb and tissue paper (CATP) degree program with a classical music emphasis. San Francisco's UC Berkeley has a six-year CATP program that focuses on jazz.

3.3.6 AEROPHONES: WIND INSTRUMENTS, INCLUDING THE VOICE

Here's how aerophones work:

- You blow into the instrument, setting a reed (or reeds) vibrating (woodwinds, saxes, harmonicas).

  OR

  You blow into the instrument while buzzing your lips (brass instruments).

- A *column of air* (the intermediary) inside the instrument transmits the vibrations of the reed(s) or your lips to the resonator, such as the body of a saxophone or trumpet.

- The resonator, being much more massive than the reed(s) or your lips, *amplifies* the vibration of the reed(s) or your lips.

Aerophones include:

- Brass instruments
- Woodwinds
- Flutes, recorders, penny whistles
- Harmonicas (a harmonica is easily the best instrument to play at night around the campfire, to drown out the sound of the musical saw)
- Reed pipes
- Accordions, concertinas, etc.
- The voice

As for your voice, air pressure serves as the power supply, the same as in other aerophones:

- You take a breath and, as you let it out, the air pressure sets your vocal folds (also called vocal cords) vibrating.

- A *column of air* (the intermediary) inside your respiratory tract, elevated in pressure, transmits the vibrations of your vocal folds to several resonators: the hard cartilage of the trachea (windpipe) and bronchial tubes in your chest, the bones of your rib cage, your pharynx (throat), and the various bones in your head.

- These resonators, being much more massive than your vocal folds, *amplify* the vibrations of your vocal folds.

(The above is a rough description. There's no unanimous agreement on precisely how everything happens in the production of human vocal sound.)

The consonants and other sounds you require for speech and singing depend on how you position your tongue and shape your oral cavity.

EVOLUTION OF STRING PLAYERS AND BRASS PLAYERS

Why can't they get along?

According to a survey of Glasgow-based symphony orchestra musicians, here's how string players view brass players:

- Slightly oafish and uncouth
- Heavy boozers
- Empty vessels
- Like to be in the limelight
- Loud-mouthed and coarse
- Don't practise

And here's how brass players view string players:

- Like a flock of bloody sheep
- Precious
- Overly sensitive and touchy
- Humourless
- Think they're God's gift to music
- A bunch of weaklings

As if that weren't bad enough, in 2004, the string section of the Beethoven Orchestra of Germany went to court to get more money than the brass players. The string players argued they deserved higher pay because they play more notes than the brass players.

Perhaps a Ph. D. candidate in search of an interesting research project could devise a method for testing the implied hypotheses of the Glasgow musicians: that brass players evolved from drunken oafs, and string players evolved from humourless sheep.

3.3.7 CHORDOPHONES: STRINGED INSTRUMENTS

Chordophones include *all* stringed instruments, not just instruments that you can play chords on.

Chordophones work like this:

- You pluck, bow, or hammer the string(s), setting the string in motion.
- A *bridge* (the intermediary) transmits the vibration of the string to the resonator, such as the body of a guitar or fiddle, or the soundboard inside a piano.
- The resonator, being much more massive than the string, *amplifies* the vibration of the string(s).

Some important chordophones are:

- Guitars, banjos and other lute-type instruments
- Harps (Celtic, concert, etc.)
- String section instruments: violin, viola, cello, double bass

- Pianos (the piano is often mistakenly thought to be a percussion instrument because hammers hit strings)
- Zithers

3.3.8 ELECTROPHONES: INSTRUMENTS THAT PRODUCE SOUND ELECTRONICALLY

If a musical instrument does not require electricity to produce its sound, you can almost always classify it as an idiophone, membranophone, aerophone, or chordophone.

After that, it gets tricky.

Keyboard instruments in which sounds are produced wholly by electronic oscillators are practically always considered *electrophones*.

Nailing down what *other* kinds of instruments constitute electrophones poses all sorts of problems:

- An electric guitar is usually considered a chordophone. But whether that would apply to purely digital electric guitars is contentious.

- Same applies to other instruments that look like acoustic instruments, or something like acoustic instruments, but produce sound by digital means, and may or may not mimic the sounds of acoustic instruments.

- Technically, samplers and turntables would be considered electrophones, even though much of the "sound of origin" is acoustic.

- Electronic devices used for sound generation, sound processing, and sound playback are widely "played" live by musicians, and would never previously have even been considered musical instruments—mixers and computers, for example. Here, the line between musical instruments and electronic sound shapers or processors gets infinitely fuzzy.

3.4
Tone Properties and Their Emotional Effects

3.4.1
EMOTIONAL VALENCE AND INTENSITY

To close out this chapter on tones and overtones, a word or two on the emotional effects of tone properties.

Chapter 9 goes into considerable detail about music and emotional arousal. However, every chapter from this one through Chapter 10 discusses the emotional effects of some element or elements of music (including lyrics). Emotions have a couple of properties:

1. Valence

Valence just refers to kinds of emotions, such as anger, sadness, or joy, and whether they're *positive* or *negative*. (Emotions aren't neutral.)

- **Some positive emotions:** adoration, tenderness, amusement, glee, delight, bliss, gratitude, serenity

- **Some negative emotions:** depression, despair, anxiety, panic, abhorrence, bitterness, embarrassment, guilt

As discussed in Chapter 1, emotions evolved as adaptations. They tend to manifest automatically, usually in response to some kind of surprise. Sometimes they spark quick action, not only in humans but in many species—for example, the universal fight-or-flight response to something in the environment that engenders rage or fear, respectively.

2. Intensity

Intensity refers to the force with which you feel the emotion. For instance, depending on the circumstances, you might experience only *slight* amusement about something, such as a TV sitcom, or you might experience *extreme* amusement.

You might feel only *mildly* guilty about something you've done—or you might feel *extremely* guilty. (So ... what *did* you do?)

The next three sections discuss research findings on the emotional effects of three properties of tones: pitch, loudness, and tone color (timbre). Chapter 7 discusses tone duration because beat and rhythm measure it.

3.4.2 EMOTIONAL EFFECTS OF PITCH

Table 5 below lists research findings of some of the main emotional effects of pitch. These effects overlap to a degree with emotional effects associated with intervals (Chapter 4) and melody (Chapter 9), both being pitch-related elements of music.

Variations in pitch, like variations in tempo, tend to have substantial emotional effects.

TABLE 5 Emotional Effects of Pitch

Pitch Characteristics	Associated Emotions
Low pitch	Fear, seriousness, generally negative emotional valence; also majesty, vigour, dignity, solemnity, tenderness
Low pitch, monotonic	Anger, boredom, sometimes fear
Low pitch, especially octave leap downwards	Sadness, melancholy
High pitch	Generally positive emotional valence, happiness, grace, surprise, triumph, serenity, dreaminess

High, rising melody, especially octave leap upwards	Happiness, excitement
Wandering, unfocused	Sadness

3.4.3 EMOTIONAL EFFECTS OF LOUDNESS

Table 6 below lists some reported emotional effects of loudness.

As with emotional effects of pitch, those of loudness can be positive or negative for the same loudness characteristic, depending on the musical context.

TABLE 6 Emotional Effects of Loudness

Loudness Characteristics	Associated Emotions
Soft (quiet)	Generally negative emotional valence—sadness, melancholy; but also tenderness, peacefulness
Soft, not varying much	Tenderness
Moderate, not varying much	Happiness, pleasantness
Loud	Joy, excitement, happiness, triumph, generally positive emotional valence
Very loud, to distortion levels	Anger
Wide changes, soft to loud, especially if quick	Fear

3.4.4
EMOTIONAL EFFECTS OF TONE COLOR

To maximize emotional punch, you can use different properties of tone to reinforce the same emotion. For example, low pitch and wide variations in loudness evoke fear (e.g., the *Jaws* shark theme).

You can also easily counteract certain emotional associations of tone properties by emphasizing other tone properties. For example violin tone color by itself has negative emotional associations (such as sadness or melancholy), which you can easily counteract with high-register playing and loudness level (e.g., Irish jigs and reels).

You'll see as you go along that you can use many other musical variables to counteract or to reinforce various emotional effects to your liking.

TABLE 7 Emotional Effects of Tone Color

Tone Color Characteristics	Associated Emotions
Simple tone color, few overtones (e.g., flute)	Pleasantness, peace, boredom
Complex tone color, many overtones (e.g., over-driven electric guitar)	Power, anger, fear
Bright tone color, crisp, fast tone attack and decay in performance	Generally positive emotional valence, happiness
Dull tone color, slow attack and decay in performance	Generally negative emotional valence, sadness, tenderness
Violin sounds	Sadness, fear, anger
Drum sounds	Anger
Sharp, abrupt tone attacks	Anger

Next time you see a movie, hone in on the background music from time to time, and see if you can relate the music to what you remember of the information in Tables 5, 6, and 7 above. Professional composers of film scores tend to have a good grasp of the connections between emotional valences and elements of tone such as pitch and loudness. (Chapter 9 has more information on emotion and film music.)

EFFECTS OF MUSIC ON GENERAL HEALTH

In addition to specific emotional effects, evidence indicates music has some effects on general health. For instance, research findings indicate that ...

- Compared with passive listening, active participation in music-making boosts your immune system.
- Listening to music while running can increase the effectiveness of the exercise you do by reducing muscle tension and blood pressure.
- Patients about to undergo an operation experience less anxiety if they listen to music of their choosing for half an hour before surgery, compared with patients who don't listen to music before surgery.
- If you listen to music while exercising, it puts you in a better emotional state, and you're more likely to stick with your exercise regime.
- People who sing in choral groups report elevated levels of emotional well-being, an indication of the adaptive history of group singing.
- Music is one of many brain-stimulating activities that may help stave off dementia. To get the benefit, you have to actively play an instrument or sing, not merely listen to music.

Next, a look at the connection between overtones and the construction of scales.

4

How Scales and Intervals REALLY Work

There is geometry in the ringing of strings.
—MONTY PYTHAGOR

4.1 Scales: Brain-averse, Brain-friendly

4.1.1 What's a Scale?

Whether speaking or singing, humans automatically and effortlessly use *discrete pitches*, with only the occasional slide. By contrast, our primate cousins, such as gibbons and chimpanzees, either vocalize in pitch glides or without distinct pitches—just grunts and pants.

Discrete pitches in speech and music serve to organize sound in such a way that the brain can recognize patterns and make sense of them. Once you have more than one discrete tone, you can have a scale of some sort.

Humans undoubtedly turned discrete tones into songs long before anybody recognized the existence of musical scales. At some point, it must have become clear that the tunes people remembered tended to use the same sets of notes: scales.

A tune or melody is a coherent or distinctive succession of tone pairs called *intervals.* The notes of a tune (melody) move up and down in pitch, stepping or leaping from note to note, using the same notes time after time, like stepping up and down the same staircase.

That means the notes themselves must come from some set of related notes of different pitches. This set of notes is called a *scale*. But how does the brain recognize a set of pitches as a scale?

4.1.2
CHALK MARKS ON A CELLO FINGERBOARD

Imagine you have a cello. (Maybe you *do* have a cello.) As you know, the fingerboard of a cello has no frets. Which makes the cello an ideal instrument for this thought experiment.

- Take a piece of imaginary white chalk and make some horizontal marks at random places along the fingerboard of your imaginary cello. Say, oh, maybe eight chalk marks.

- Remove the excess imaginary chalk from your fingers by wiping your hands on your black pants or dark skirt. Nobody will be able to see the chalk marks on your clothing because, even though your clothing is real, the chalk is imaginary.

- Now, pick a string, any string. Press your finger on the string over the chalk mark nearest the narrow end of the fingerboard (the end nearest the tuning pegs). Pluck (or bow) that string. Then move to the next chalk mark. Pluck the string. Then the next chalk mark, and so on, until you've played all eight notes.

Technically, that's a scale.

Good thing that was a thought experiment. Because the scale you created and played on your imaginary cello sucks. Your brain just does not recognize it as a meaningful scale. How come?

4.1.3 BRAIN-AVERSE: WHY RANDOM SCALES SOUND BAD

If you create a random scale, a scale comprised of notes having no natural, physical relationship with each other (the way you did using random chalk marks on the cello fingerboard), then try to play a tune using that scale, your brain interprets the sound as chaos, not music.

Studies of both children and adults indicate your brain is hardwired at birth to reject random scales. Infants prefer *non-random* scales, as do adults. The frequencies of the notes comprising a scale have to have some kind of internal order—*ordered relationships with each other*—or your brain interprets the sound as noise.

But not just any ordered relationships.

Particular ordered relationships that your brain recognizes: "brain-friendly" ordered relationships of tones, as opposed to "brain-averse" chaotic non-relationships.

4.1.4 IN SEARCH OF AN ORGANIZING PRINCIPLE THAT WILL YIELD A BRAIN-FRIENDLY SCALE

Recall what happens when you pluck a guitar string that you've cut in halves, thirds, quarters, fifths, and so on, by damping the string over various frets. You get a whole series of soft overtones—overtones that sound *different* from the fundamental.

As the guitar-string-damping experiment reveals, each overtone not only sounds different, it also sounds good. Brain-friendly. So it would be a reasonable guess that a brain-friendly *scale* might have something to do with the relationships of overtones to each other.

Hmmm. Maybe relationships among the overtones hold the secret that will yield a useful scale, a group of tones in a brain-friendly ordered relationship.

Time to bring back the overtone series and have a look at overtone frequency relationships (Table 8 below). Frequency relationships among the first few overtones, the strongest ones, are of greatest interest. They're the ones you can hear by damping a guitar string at various fret positions.

TABLE 8 Fundamental and First 15 Overtones of the "Middle C" Overtone Series

Tone / Overtone	Multiple of Fundamental	Frequency (Hz)
Fundamental	1 (f)	261.6
1st Overtone	f x 2	523.2
2nd Overtone	f x 3	784.8
3rd Overtone	f x 4	1,046.5
4th Overtone	f x 5	1,308.0
5th Overtone	f x 6	1,569.6
6th Overtone	f x 7	1,831.2
7th Overtone	f x 8	2,093.0
8th Overtone	f x 9	2,354.4
9th Overtone	f x 10	2,616.0
10th Overtone	f x 11	2,877.6
11th Overtone	f x 12	3,139.2
12th Overtone	f x 13	3,400.8
13th Overtone	f x 14	3,662.4
14th Overtone	f x 15	3,924.0
15th Overtone	f x 16	4,186.0

- Start with the ratio of the first overtone to the fundamental frequency, which is 523.2 Hz : 261.6 Hz, which boils down to a simple ratio of 2:1. This simple ratio comes from the first two numbers of the middle column.
- Next, the ratio of the second overtone to the first overtone. It's 784.8 Hz : 523.2 Hz, a ratio of 3:2. (middle column, second and third numbers).
- Keep doing this for the first few overtones, and you end up with a list of simple ratios of frequencies, like this (Table 9):

TABLE 9 Simple Ratios of Frequencies

2:1
3:2
4:3
5:4
6:5... (and so on)

Next step: try out simple ratios of frequencies as an organizing principle to build a scale ...

4.1.5 USING SIMPLE FREQUENCY RATIOS TO BUILD A BRAIN-FRIENDLY SCALE

Any organizing principle worth its salt should work universally. That is, you should be able to pick any old frequency as a starting point for scale building.

RATIOS, RATIOS, RATIOS—NOT THE OVERTONES THEMSELVES

Potential Point of Confusion: Always bear in mind that it's the *ratios* of overtone frequencies that matter—not the overtone frequencies themselves!

For purposes of scale-building, it's all about **ratios** of frequencies (Table 9 above). *Ratios, ratios, ratios.*

If you don't keep this distinction in mind, you could get lost. And then the new marshal will have to organize a search party.

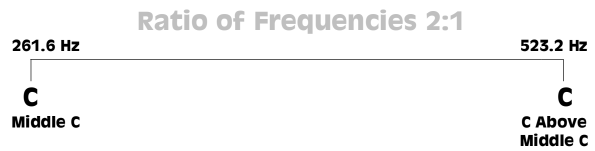
You heard right. Dodge City has itself a new marshal. In a Classic Western plot twist, Ms Puma's the new marshal now, ever since a posse tarred and feathered Marshal McDillon and ran him out of town on a rail. Why? For carrying on behind Ms Puma's back. That's why.

So, now's not the time to cross Marshal Puma by needlessly getting lost in a wilderness of frequencies.

- Start building the scale with the tone Middle C, the first tone in Table 8 above, with a frequency of 261.6 Hz.
- Next, in accordance with the organizing principle of *simple* frequency ratios, add a second note, derived from the simplest possible ratio, 2:1. What you get is a two-note "scale."

- This scale clearly has its limitations. But you have to start somewhere (Figure 5).

FIGURE 5 Scale of "Middle C" and "C Above Middle C"

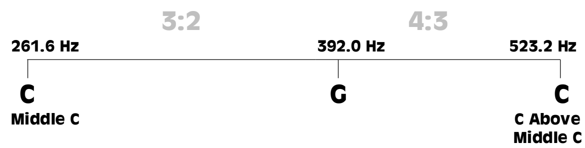


- Next, add a tone derived from the *next* simplest ratio of frequencies, 3:2. (The simplest possible frequency ratio that can identify a relationship between two tones is 2:1.) For reasons that will become clear in a little while, you can label the 3:2 tone G.

- Notice that when you add G to the scale, the relationship between G and the C above Middle C also happens to be a simple ratio of frequencies, 4:3.

- Now you've got a scale of three notes. It sounds good, too. The organizing principle looks promising (Figure 6).

FIGURE 6 C - G - C Scale

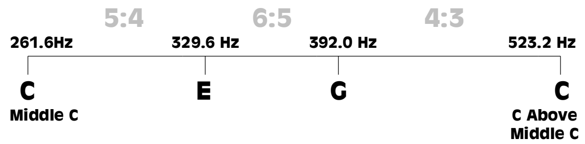


- Notice the big gap between Middle C and G. Fortunately, a tone derived from the simple frequency ratio 5:4 fits beautifully, right between Middle C and G. Call it E.

- When you add E to the scale, the relationship between E and G turns out to be a simple ratio of frequencies, namely, 6:5. Amazing.

- The scale grows to four notes (Figure 7 below). Sounds great, too. These four notes correspond to the words "say, can you see," in the American national anthem, music composed by John Stafford Smith, a London, England, church organist.

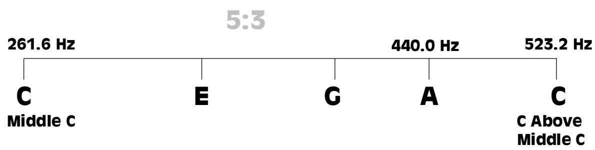
FIGURE 7 C - E - G - C Scale



- Next, have a look at the big gap between G and C above Middle C. It so happens that yet another tone derived from a simple frequency ratio, 5:3, fits right in there. This tone happens to be the lovely and talented Concert A (also commonly called A-440). More about lovely, talented Concert A later on.

- The scale grows to five notes (Figure 8):

FIGURE 8 C - E - G - A - C Scale

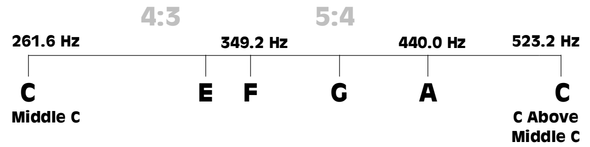


- You can fill in another big gap, the one between E and G, using another note derived from the simple frequency ratio, 4:3. The note F relates to Middle C by the this simple ratio.

- When you insert F into the scale, it relates to Concert A by the simple ratio of frequencies, 5:4.

- Now the scale has grown to six notes. So far, so good (Figure 9).

FIGURE 9 C - E - F - G - A - C Scale



- Only a couple of big gaps remain, one between Middle C and E, and another between Concert A and C above Middle C. The simplest frequency ratio available to fit between C and E is 9:8, which yields the note D.

- You can use the same 9:8 frequency ratio to stick a tone between Concert A and C above Middle C. Call it B.

- When you insert these two notes (D and B), you notice a few things:

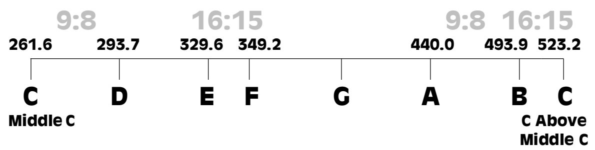
  - The scale has no more big gaps between notes;

  - The smallest gap between notes has a ratio of frequencies of 16:15—not exactly simple;

  - The order of the letter-names of the notes makes some sense, though not plain, common horse sense. The alphabet starts at C, stops at G, then starts again at A.

- Now you've got an 8-note scale. Which includes the 8th note. Which is the same as the first note, but higher in pitch (Figure 10):

FIGURE 10 C - D - E - F - G - A - B - C Scale



This scale definitely sounds brain-friendly. Looks like the organizing principle of tones derived from simple frequency ratios has worked. (Whew!)

4.1.6 THAT FAMILIAR "DO-RE-MI" SCALE

If you're European, you'll recognize the scale in Figure 10 as the "do-re-mi" scale, using the *solmization* system, which designates notes using syllables instead of letter names:

do re mi fa so la ti do

Or, if you're going down the scale:

do ti la so fa mi re do

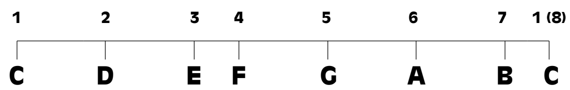
Or, as the von Trapp family sang in *The Sound of Music*:

Doe, a deer, a female deer
Ray, a drop of golden sun
Me, a name I call myself
Fah, a long long way to run...

(They could sing better than they could spell.)

You get the same scale when you play the white notes on the piano starting at C. Any old C. You don't have to start with Middle C (Figure 11):

FIGURE 11 The "Do-Re-Mi" Scale in All Its Glory



Since the scale has eight notes (including the first and last notes), the pitch gap between the first note and the eighth note is called an *octave*.

In music, the pitch gap between any two notes is called an *interval*. Think of an interval as a *relationship* between two pitches. You can play the two pitches successively—usually the lower one first—or simultaneously.

So, that makes the pitch relationship between the first note and the eighth note an *interval* of an *octave*.

MELODIC INTERVALS VS HARMONIC INTERVALS

Another Potential Point of Confusion: The term "interval" also has a meaning with respect to chord progressions, as you'll find out in Chapter 6. Harmonic intervals occupy a different musical space than the melodic intervals discussed here.

By the time you finish Chapter 6, if you don't understand the distinction, you could get lost. Which might not cause you too much trouble if you happen to meet up with Ex-Marshal McDillon, who's still out there, wandering around in the wilderness in his tar and feathers. He's got excellent survival skills, though, even without his horse, and, as a musical saw player, he can tell you pretty much everything you need to know about the distinction between melodic and harmonic intervals. But you have to find him, first.

That last note of the scale sounds exactly like the first note, and yet ... well ... "higher" in pitch. The same, but somehow different. The terminology, familiar to everybody who plays music, goes like this: the last note of the scale is an "octave higher" than the first note.

As you can see in Figure 11 above, the eight notes of the do-re-mi scale are not evenly spaced. Still, when you play this scale, it sounds agreeable whether you play it from bottom to top or top to bottom. It sounds as though the notes are proceeding smoothly up and down the pitch "staircase." As though all the notes are the same distance apart. Even though they obviously are not.

How come? What if all the pitches were *actually* the same distance apart?

4.1.7 MORE BRAIN-AVERSE: EQUAL-INTERVAL SCALES

So far, you've tried two different organizing principles to construct an agreeable-sounding scale:

- A scale of *random* notes—the experiment with the chalk marks on the cello fingerboard. Result? A brain-averse scale. Chaotic and completely "unmusical."

- A scale of notes related to each other by *simple ratios of frequencies*. Result? A brain-friendly scale. Clearly "musical," beautiful- sounding. A scale consisting of a distinctive but uneven order of tones.

Now, just for good measure, try a third organizing principle: a completely regular, *evenly-spaced* order of tones.

Start at Middle C and divide the octave into seven equal intervals, for a total of eight notes (Figure 12 below). The lowest note is Middle C and the highest note is C above Middle C. All eight notes are spaced the same distance apart, frequency-wise (37.4 Hz between each note).

No point in naming notes 2 through 7 because this scale is only theoretical.

And a good thing, too. Because, like the random scale of chalk-and-cello fame, this scale also sucks (Figure 12):

FIGURE 12 The "Eight-Note, Seven-Equal-Interval" Scale

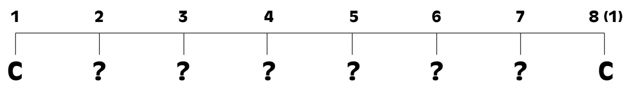


Table 10 below shows the frequencies for the eight notes of this scale, compared with the "do-re-mi" scale frequencies. As you can see, they're all different, by roughly five to 24 Hz, except for the first and last "C" notes.

TABLE 10 "Eight-Note, Seven-Equal-Interval" vs "Do-Re-Mi" Scale Note Frequencies

Note	"Seven-Equal-Interval" Scale Note Frequencies (Hz)	"Do-Re-Mi" Scale Note Frequencies (Hz)
1 (C)	261.6	261.6
2	299.0	293.7
3	336.3	329.6
4	373.7	349.2
5	411.1	392.0
6	448.5	440.0
7	485.8	493.9
1 (8) C	523.2	523.2

4.1.8 BRAIN-FRIENDLY: A NATURALLY-SELECTED SPECIALIZATION FOR SIMPLE FREQUENCY RATIOS

Substantial research findings show that, if you try to create music using scales that have no tones in relationships of *simple frequency ratios*, your brain stops recognizing "musical" sound and hears chaos. Like the static you get when you move your analog radio dial between stations.

Infants respond to changes in pairs of tones *only* if the tones are related by small-integer, simple frequency ratios—the tones that emerge from the harmonic series. Tones not related by simple frequency ratios simply do not elicit responses from babies. This strongly indicates that the human brain has a naturally-selected specialization for simple frequency ratios—that these preferences are *not cultural constructs*.

Not only that, infants remember scale tones when the intervals of the scale are of *unequal* size, compared with scales having intervals of equal size. This is consistent with the unequal-interval scales that emerge from the harmonic series. As you'll see in Chapter 5, most scales used commonly worldwide have only five to seven different tones (i.e., not including the second octave note), which are *unequally* spaced.

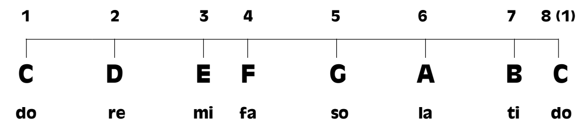
Infants also have difficulty resolving tones that are close together. Tones spaced close together are not related by simple frequency ratios.

To summarize, your brain can make sense of, and prefers, scales of non-random but unequally-spaced tones—pitches related to each other in simple multiples or simple fractions of a fundamental frequency.

4.1.9 FILLING IN THE LAST GAPS: THE CHROMATIC SCALE

Look at all those (comparatively) wide intervals between some of the notes (Figure 13 below). Between C and D. Between D and E. Between F and G. Between G and A. Between A and B. Five intervals.

FIGURE 13 The "Do-Re-Mi" Scale



Those five intervals look suspiciously like they're exactly twice as wide as the two smaller intervals, the ones between E and F, and B and C. If the five bigger intervals *are* exactly twice as wide as the two smaller ones, and if you were to insert a tone into each of those wide gaps, you'd have:

- A 12-*equal-interval* scale (a total of 13 tones, including the first and last ones, which are the same note, an octave apart);

- A scale composed of *close-together* tones.

Precisely the recipe for *non*-musicality. So, would such a scale actually sound chaotic?

The answer is yes, it would sound chaotic. Not at all musical.

However, that does not mean such a scale would have no musical value. As you'll see shortly, the 12-equal-interval scale serves a valuable purpose as a *pool of tones* you can dip into and use in the construction of many different, truly musical scales. You can also use the same 12-equal-interval scale as a pool you can dip into for colourful extra notes when writing a song.

(While most equal-interval scales are inherently chaotic and unmusical, a few are actually palatable. Chapter 5 discusses an example of a *musical-sounding* equal-interval scale—an exception to the rule.)

For now, go ahead and fill in the five wide gaps in the above scale (Figure 13) with five new notes.

But before you do that, you'll need names for the new notes. Problem is, there's no letter of the alphabet between C and D, or D and E, or F and G, etc. What to do?

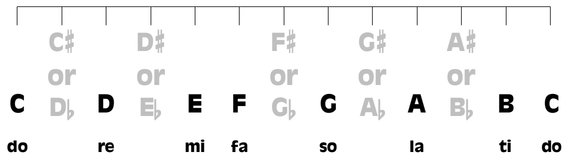
- Suppose you start at C, you're going up to D, and you want to stick a note in between. Since you're going "up" in pitch, call the in-between note a *sharp* note (symbolized ♯).

- If you're going "down" in pitch, from D down to C, call the same in-between note a *flat* note (symbolized ♭).

(This nomenclature will become a lot clearer shortly.)

So ... here's what you get when you fill in the last five gaps of the "do-re-mi" scale (Figure 14):

FIGURE 14 The "Do-Re-Mi" Scale With the Gaps Filled In



On the piano, if you start with the note Middle C (or any other C), you'll notice that the in-between notes correspond to the black keys.

- The smallest interval in the above scale, the interval between any two *adjacent* notes, is called a *semitone* or *half-step* (for example, between C and C♯, or between E and F). So, an interval of an octave is comprised of 12 *semitone intervals.*
- The next smallest interval, the distance covered by two semitones, is called a *tone*, or a *whole tone*, or a *step*.

And the name of the above 13-note (12-semitone) scale is the *chromatic scale*. The five new notes added to the do-re-mi scale are called *chromatic notes*.

4.1.10 *E UNUM PLURIBUS* ... MANY SCALES OUT OF ONE

To play the chromatic scale, just start at any C, then play every note...C, C♯, D, etc., all the way up to the next C. When you do this, you play 13 notes, but only 12 *intervals* of one semitone each. (Remember, an interval is not a note. It's the pitch *distance* between two notes.)

LA-DI-DA: CHROMATIC SOLMIZATION (YOU DON'T NEED TO KNOW THIS, BUT IT'S KIND OF INTERESTING)

More than a thousand years ago, a nerdy Italian friar and music theorist named Guido (Guido d'Arezzo, 995-1050), with more time on his hands than he knew what to do with, invented solmization ("do re-mi"). Guido also invented the basics of modern music notation.

Everyone's familiar with "do re mi fa so la ti do". However, if you haven't studied music in Europe, you may not know about the *additional syllables* for the chromatic notes, syllables such as li, te, le, fi, and so on. (Yikes!)

Not only do the chromatic notes have their own syllables, but the syllables are *different* for the *same note*, depending on whether you're *ascending* the scale, or *descending* it. Here they are:

ASCENDING ("do di re...") (chromatic notes in **bold**)	**DESCENDING ("do ti te...")** (chromatic notes in **bold**)
do	do
ti	ti
li	**te**
la	la
si	**le**
so	so
fi	**se**
fa	fa
mi	mi
ri	**me**
re	re
di	**ra**
do	do

Do people actually study this stuff?

Oh yes they do. They even claim it's useful, and so it is, once you get into it. For instance, when you learn scales other than the standard do-re-mi scale (scales that include some chromatic notes), you can learn an equivalent do-re-mi syllable-based way of remembering each separate scale.

As you'll see in later chapters, heavy metal musicians (among others) make use of scales called *modes*, and each mode can be translated into a do-re-mi type of scale using the above syllables.

So, the chromatic scale does sound chaotic—not naturally musical. However, you can grab notes from the chromatic scale to craft numerous naturally musical scales. These agreeable-sounding scales contain only eight or fewer notes, selected from the chromatic scale. Chapter 5 discusses some of them.

For now, though, a bit more about the "do-re-mi" scale.

Its common name is the *major scale*. It consists of eight notes, spaced by seven intervals of tones and semitones in this order:

tone, tone, semitone, tone, tone, tone, semitone

This type of scale is called a *diatonic* scale. "Dia" comes from the Greek word for "through" or "by." And "tonic" refers to the tonal anchor of the scale—the first note of the scale—called the *tonic note.* So a "diatonic" scale's notes are related to each other "through" the first, or "tonic" note of the scale.

More on this in Chapter 5, which discusses *tonal music* in detail.

4.2 Intervals

4.2.1 THE BASIC INTERVALS

So far, three intervals have made an appearance:

- *Octave*: Pitch distance between the first note and the eighth note of the major scale (or first note and 13th note of the chromatic scale)

- *Semitone*: Pitch distance between any two *adjacent* notes of the chromatic scale

- *Tone*: Pitch distance of two semitones

Other intervals exist, and they all have names, but not interesting ones like Natasha or Engelbert. Since the semitone is the smallest interval, you can measure the other intervals in multiples of semitones.

Even the tone and the semitone have their own special alternative "interval" names.

Table 11 below lists all of the intervals within an octave. Usually (but not always), you reckon an interval—which is always two notes—as starting from the lower note and going to the upper note, as in the "Example" column in Table 11.

TABLE 11 Names of Basic Intervals

Interval	Number of Semitones	Example
Minor Second	1	C – C♯
Major Second	2	C – D
Minor Third	3	C – E♭
Major Third	4	C – E
Perfect Fourth	5	C – F
Augmented Fourth	6	C – F♯
Perfect Fifth	7	C – G
Minor Sixth	8	C – A♭
Major Sixth	9	C – A
Minor Seventh	10	C – B♭
Major Seventh	11	C – B
Octave	12	C – C

4.2.2 INTERVAL NAMES EXPLAINED

Figure 15 (below) clarifies the logic of interval names a bit:

FIGURE 15 C Major Scale with Intervals Named

C		D		E	F		G		A		B	C
Tonic Note	Min 2nd	Maj 2nd	Min 3rd	Maj 3rd	Perf 4th	Aug 4th; Dim 5th	Perf 5th	Min 6th	Maj 6th	Min 7th	Maj 7th	Octave

For reasons that will become clearer as you get better acquainted with intervals and scales and chords, all of the intervals are named with reference to the *first note* (the *tonic note*) of the *major scale*. For example, *major second* refers to the *second* note of the major scale, if you start from the tonic note.

The major scale has only eight notes. That's why none of the intervals has a name higher than "seventh," even though there are 12 different intervals.

(The intervals are not named after the notes of the chromatic scale because the chromatic scale by itself has no use as a "musical" scale.)

Here's how each interval gets its name:

- ***Major Second*** and ***Minor Second:*** Both named for the second note of the major scale. The major second is an interval of a whole tone. The minor second is an interval of a semitone.

- ***Major Third*** and ***Minor Third:*** Both named for the third note of the major scale. The major third is an interval of four semitones. The minor third is a semitone less, at three semitones.

MINOR CONFUSION

Yet Another Potential Point of Confusion: The term "minor," when referring to intervals (such as "minor third"), has a different meaning from the term "minor" when referring to *keys*, (such as "key of D minor"). Chapter 5 discusses keys.

If you confuse the meanings of "minor interval" and "minor key," you're apt to get lost.

If you were to get lost, Marshal Puma would probably conscript Deputy Fester and Doc Yada-Yadams to saddle up and fetch you back. Deputy Fester never learned to ride so good and nobody can figure out how he got to be a deputy. As for Doc, he's three-fifths drunk, 80% of the time and can't stay on his horse unless

somebody does up his seat belt for him. Neither Fester nor Doc would be much good in a search party. So, if you steer clear of any confusion about minor intervals and the minor keys, you'll stay found.

- ***Perfect Fourth*:** Named for the fourth note of the major scale. It's an interval of five semitones. It's called "perfect" because, compared with the augmented fourth, it sounds a lot more, um ... "perfect." At least in the context of a chord or a tune.

- ***Augmented Fourth:*** A wild, unruly interval, it's also named for the fourth note of the major scale. However, the augmented fourth overshoots the perfect fourth by a semitone, for a total of six semitones. This interval has several other names. It's often called the *tritone* because it spans three whole tones (six semitones). It's also known as the *diminished fifth*, because it's a half-tone short of being a "perfect" fifth. In the Middle Ages, they called it *diabolus in musica*—the "devil in music." Somebody had a sense of humour way back then. Or ... maybe they believed it *was* the musical devil hisself.

- ***Perfect Fifth:*** Named for the fifth note of the major scale. It's an interval of seven semitones. It's called "perfect" because, compared with the diminished fifth, it sounds a lot more "perfect" in the context of a chord or a tune. (But, as you'll see, "perfect" doesn't necessarily mean "interesting." Just like people.)

- ***Major Sixth*** and ***Minor Sixth:*** Named for the sixth note of the major scale. The major sixth is an interval of nine semitones. The minor sixth, one less at eight semitones.

- ***Major Seventh*** and ***Minor Seventh:*** Named for the seventh note of the major scale. The major seventh is an interval of eleven semitones. The minor seventh is one less, at ten semitones.

MORE MINOR CONFUSION

Yet Another, *Another* Potential Point of Confusion: Here we go again. As you've learned, there's a difference between minor *intervals* and minor *keys*.

Well, there's also a difference between minor intervals and minor *chords*, such as, for example, the chord "D minor seventh," which is neither an interval nor a key.

Chapter 6 discusses chords in harrowing detail. For now, just be aware that, if you confuse the meanings of

- minor interval,
- minor chord, and
- minor key,

you could get lost.

You don't want to get lost right now, because Marshal Puma's in no mood for organizing search parties. She just found out that Ex-Marshal McDillon and Doc and Deputy Fester have all been partying on Doc's moonshine in a gully south of Dodge with a bunch of mid-west farmers' daughters from the Beach Boys song, "California Girls," who really make them feel alright. Looks like it's all over between Marshal Puma and Ex-Marshal McDillon.

4.2.3 PERFECT FIFTHS AND SCALE CONSTRUCTION: MONTY PYTHAGOR'S METHOD

You may wonder who first figured out the relationship between lovely-sounding overtones, simple frequency ratios, and their application to scale building.

People usually credit the Greek philosopher, mathematician, and comedian, Monty Pythagor. As you know, Mr. Pythagor also formulated the Pythagorean Theorem about the square hide of the hippopotamus and the sum of the other square hides, which apparently revolutionized the footwear industry.

Mr. Pythagor (582 BC - 496 BC) may have figured out the mathematics of overtones and scales 2,500 years ago but he certainly was not the first to discover musically-pleasing scales. As discussed in Chapter 1, Neanderthals had bone flutes with diatonic scale notes tens of thousands of years ago.

As for Mr. Pythagor, it seems he realized that if you kept adding tones in consecutive frequency ratios of 3:2 (perfect fifths), you would get a pleasing-sounding musical scale. Next time you're near a keyboard, try this:

- Play the note:

  C

- Now play the perfect fifth (seven semitones) above, which is G:

  C G

- Next, play the perfect fifth (seven semitones) above G, which happens to be D, like this:

  G D

- Next, play the perfect fifth above D, which is A:

  D A

- Then the perfect fifth above A, which is E:

  A E

- Then the perfect fifth above E, which is B:

  E B

So far, you've played the following sequence of six notes:

C G D A E B

The highest note, B, is almost three octaves above the C you started with.

The next step is to play all six notes *in the same octave*, and *in scale order*. Then add another C to complete the scale. Now you have the following seven-note scale:

There you go. That's almost the diatonic major scale.

You can construct a good many of the world's popular musical scales simply by using notes derived from consecutive frequency jumps in the ratio of 3:2, the ratio of the perfect fifth interval.

And, as discussed earlier, when you plunk a bunch of these notes into the same octave, you end up with other simple frequency ratios *within* the scale as well, such as 2:1 (octave), 4:3 (perfect fourth), 5:4 (major third), and so on.

So, since Mr. Pythagor figured out the principle of creating scales derived from simple frequency ratios, such scales are called *Pythagorean scales*. The "do-re-mi" major diatonic scale is a Pythagorean scale, even though it's not *perfectly* based on consecutive intervals in ratios of 3:2.

"Not perfectly" means something goes awry. Here's how:

So far, you've seen that if you use the strict Pythagorean method, you get these six different notes (the octave note is repeated):

C D E G A B C

It's *almost* the major diatonic scale. But one note's missing, namely F.

So, why not try to get that last note by playing the next note, a fifth interval (seven semitones) up from B, which was the last note you played in the series?

Try it.

What's the note you get?

Alas, it's F♯, not plain old F.

Worse, the fifth above F♯ is C♯, not C.

Dang.

Worse still, suppose you go away from the piano and instead decide to derive the series of notes using a calculator. You start with the frequency 261.6 (Middle C) and use your calculator to derive the series of fifth intervals as *exact* ratios of 3:2. Then you compare your list of calculated frequencies with the actual frequencies of the corresponding piano notes (available on Roedy Black's *Musical Instruments Poster*).

What you discover is that all the theoretical notes you calculated are slightly but noticeably *sharper* than the notes on the piano!

Dang again.

In any case, the fact that you can *almost* get a complete major diatonic scale simply by using notes derived from consecutive overtone frequencies with the single simple frequency ratio 3:2 (the perfect fifth) illustrates the central role of simple frequency ratios in scale building.

4.2.4 THE PYTHAGOREAN COMMA

Suppose you were to start with the frequency for Middle C and just keep on going, up and up in leaps of perfect fifth intervals, until you eventually reach the note C again, in a much higher octave.

The first question is, would you ever get to C again, somewhere over the rainbow, way up high?

Yes, indeed. Especially in Kansas.

It takes 12 leaps of perfect fifths to get to another C. You end up seven octaves above the C that you started with.

If you start from Middle C and use a calculator to multiply each successive frequency by a ratio of 3:2 (the simple frequency ratio of the perfect fifth interval), you get the data in Table 12. (It's theoretical, because the last note is well above the upper limit of human hearing. Way over the rainbow.)

TABLE 12 Consecutive Perfect Fifth Intervals Going Up Seven Octaves

Note	Frequency (Hz)
Middle C	**261.6**
G	392.4
D	588.6
A	882.9
E	1,324.4
B	1,986.5
F♯	2,979.8
C♯	4,469.7
G♯	6,704.5
D♯	10,056.8
A♯	15,085.2
F	22,627.8
C, seven octaves up from Middle C	**33,941.6**

Now, just for fun (are you having fun?), try getting to that same C, seven octaves above Middle C, except do your leaps in *octaves*, instead of perfect fifths.

Start with Middle C at 261.6 Hz and keep doubling the frequency to preserve the 2:1 simple frequency ratio that defines an octave interval. Table 13 shows what you get.

TABLE 13 Consecutive Octave Intervals, Going Up Seven Octaves

Note	Frequency (Hz)
Middle C	**261.6**
C , one octave up	523.2
C, two octaves up	1,046.4
C, three octaves up	2,092.8
C, four octaves up	4,185.6
C, five octaves up	8.371.2
C, six octaves up	16,742.4
C, seven octaves up from Middle C	**33.484.8**

Have a look at the last frequency in Table 12 and compare it with the last frequency in Table 13.

They're both supposed to be the note C, seven octaves above Middle C, right? So the two frequencies are supposed to be exactly the same, aren't they?

But they ain't.

The ratio between them, 33,941.6 Hz : 33,484.8 Hz, boils down to a ratio of 1.0136:1, instead of 1:1.

Dang, for the third time.

That ratio of 1.0136:1 is called the *Pythagorean comma*. (In music, a tiny interval is called a *comma*.)

The Pythagorean comma caused all sorts of havoc with instrument tuning for more than 2,000 years after Monty Pythagor died of laughter, without telling anybody how to fudge the Pythagorean comma and stay in tune.

(Chapter 5 discusses some clever jiggery-pokery, called *equal temperament*, that gets around the Pythagorean comma and cures all problems with scales forever. Well, sort of.)

4.2.5 WHY PYTHAGOREAN SCALES EMERGED INDEPENDENTLY ON SEVERAL CONTINENTS

As discussed in Chapter 3, the human brain has the ability to automatically analyse a tone's constituent harmonics and identify the soundmaker. That means the brain has the ability to understand (and appreciate) simple ratios of frequencies, whatever

form they take—overtones of a single tone, or scales consisting of notes in simple-frequency relationships.

So, whenever humans stumble upon a way of generating a series of notes in simple-frequency relationships, they find the notes pleasing and make music. *Homo neanderthalensis* knew how to do this, and they weren't even of our species, *Homo sapiens*.

The harmonic series is a phenomenon of nature that anybody anywhere can generate with nothing more than a string or a piece of catgut or sinew attached via some sort of bridge to a resonator. Easy to make. Pleasing, You get simple-frequency-ratio discrete notes.

It's no wonder, then, that Pythagorean-type scales, especially pentatonic scales (discussed in Chapter 5), have emerged independently in the musical cultures of all the major civilizations, from Africa to Europe to Asia. Humans everywhere prefer music made with tones in relationships of simple frequency ratios. Even a 22-tone scale used in India shows an underlying Pythagorean structure, no doubt derived from the harmonic series.

4.2.6
CONSONANCE AND DISSONANCE

Some intervals sound stable, balanced, at rest, when you play the two notes either together or successively. That's called *consonance*.

Others sound unstable, unbalanced, restless. That's *dissonance* (Table 14).

TABLE 14 Consonant and Dissonant Intervals

Interval	Number of Semitones	Example	Consonant/ Dissonant
Minor Second	**1**	**C – C♯**	**Dissonant**
Major Second	**2**	**C – D**	**Dissonant**
Minor Third	3	C – E♭	Consonant
Major Third	4	C – E	Consonant
Perfect Fourth	5	C – F	Consonant
Augmented Fourth	**6**	**C – F♯**	**Dissonant**
Perfect Fifth	7	C – G	Consonant
Minor Sixth	8	C – A♭	Consonant
Major Sixth	9	C – A	Consonant
Minor Seventh	**10**	**C – B♭**	**Dissonant**
Major Seventh	**11**	**C – B**	**Dissonant**
Octave	12	C – C	Consonant

Pick an interval, any interval. Play the two notes of the interval simultaneously on a guitar or keyboard, the way you would play a chord. Or successively, the way you would play a tune. Go through the list yourself and try out all the intervals.

Consonance vs dissonance goes straight to the heart of what helps make music exciting and emotional (a good amount of dissonance), or predictable and dull (too much consonance). In music, "dissonant" does not mean "grating" or "harsh." Rather, it refers to the sense you get of tonal *unrest*, the seeking of tonal resolution which imparts motion to melody and harmony.

Later on, you'll find that chords, because they're comprised of two or more intervals (three or more notes), also have consonant or dissonant characteristics, depending on the intervals within the chord.

The notes of a tune (melody) against the backdrop of a chord progression produce consonant or dissonant sounds, too.

HAPPY THIRDS AND SAD THIRDS: GREAT COUNTRY HITS OF AUCTIONEERS AND CHICKADEES

If you live near the sea, you may hear foghorns every so often. What's that interval, the descending

Dah
Dah ?

It's a descending major third. People just love that major third. It's also the cheerful "ding-dong" of your doorbell.

And it's the main interval the auctioneer uses as he or she disposes of the family farm. In 1956, Leroy Van Dyke and Buddy Black wrote a country classic called "The Auctioneer," which highlights the auctioneer's major third sing-song patter. Gordon Lightfoot recorded a fine version of this tune on his 1980 album *Dream Street Rose*.

The *minor* third, on the other hand, has a decidedly sad sound. It's the chief interval in the children's chant, "Ring Around the Rosie" (the interval on the word, "ros - ie"), also known as "Nyah-Nyah-Nyah-Nyah Nyaaaaah Nyah."

The male chickadee uses a sliding descending minor third during mating season. The call goes from A down to F♯, or B♭ down to G. Women chickadees love that sad tune. The slide into the

second note of the interval is characteristic of sad country songs. Male chickadees may have been the first true country singers.

4.2.7 DISSONANCE: FREAKY FREQUENCY RATIOS

What causes intervals (and, by extension, chords) to sound consonant or dissonant?

Have a look at the ratios of frequencies that correspond to consonant vs dissonant intervals (Table 15).

TABLE 15 Frequency Ratios of the Intervals

Interval	Semi-tones	Example	Freq. Ratio	Consonant/ Dissonant
Unison	0	C – same C	1:1	Consonant
Minor Second	**1**	**C – C♯**	**16 : 15**	**Dissonant**
Major Second	**2**	**C – D**	**9 : 8**	**Dissonant**
Minor Third	3	C – E♭	6 : 5	Consonant
Major Third	4	C – E	5 : 4	Consonant
Perfect Fourth	5	C – F	4 : 3	Consonant
Augmented Fourth	**6**	**C – F♯**	**45 : 32**	**Dissonant**
Perfect Fifth	7	C – G	3 : 2	Consonant
Minor Sixth	8	C – A♭	8 : 5	Consonant
Major Sixth	9	C – A	5 : 3	Consonant
Minor Seventh	**10**	**C – B♭**	**9 : 5**	**Dissonant**
Major Seventh	**11**	**C – B**	**15 : 8**	**Dissonant**
Octave	12	C – C_1	2 : 1	Consonant

Some intervals have simple frequency ratios, such as the major third (ratio of 5:4). Others have complex ratios, especially the augmented fourth (ratio of 45:32), the freakiest of them all.

In general, you get consonant intervals from the simplest frequency ratios, the ones with small numbers. You get dissonant intervals from complex frequency ratios, the ones with larger numbers.

Degree of perceived consonance vs dissonance is a function of pitch relationships among tones. Also, as discussed a bit later (Chapter 6), consonant intervals have overtones in common, or overlapping. Dissonant intervals tend not to.

Infants show clear preferences for consonant intervals, based on simple frequency ratios, such as fourths and fifths, and show a distinct aversion to dissonant intervals, such as the tritone. This indicates such preferences are wired in the brain at birth. It also underscores the futility of trying to build audiences for unpalatably dissonant music.

In an experiment comparing consonant-dissonant preferences of humans and cottontop tamarins, the monkeys showed no clear preference for consonant intervals over dissonant intervals. In the same experiment, humans showed a clear preference for consonant intervals, supporting the theory that music is a species-specific adaptation in humans only.

4.2.8 INTERVALS WITHIN SCALES

So far, the discussion of intervals has focussed on intervals in which the first of the two notes is the lowest note of the scale, the tonic.

Can an interval start on *any* note?

Sure. You can start on the note A, the sixth note of the C major scale. If you then go up three semitones to C, that's an interval of a minor third. *Any* span of three consecutive semitones is a minor third interval, no matter where it occurs in a scale. Consider, for example, the intervals within this scale (Figure 16):

FIGURE 16 C Major Scale

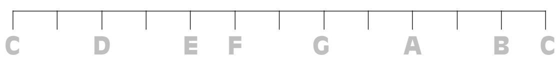


Table 16 below shows intervals drawn exclusively from the C major scale—no chromatic notes.

TABLE 16 Intervals Occurring Naturally in the Major Scale

Interval	Semi-tones	Example	Freq. Ratio	Consonant/ Dissonant
Minor Second	**1**	B – **C**	**16 : 15**	**Dissonant**
Major Second	**2**	**C** – D	**9 : 8**	**Dissonant**
Minor Third	**3**	A – **C**	6 : 5	Consonant
Major Third	**4**	**C** – E	5 : 4	Consonant
Perfect Fourth	**5**	**C** – F	4 : 3	Consonant
Augmented Fourth	**6**	F – B	**45 : 32**	**Dissonant**
Perfect Fifth	**7**	**C** – G	3 : 2	Consonant
Minor Sixth	**8**	E – **C**	8 : 5	Consonant
Major Sixth	**9**	**C** – A	5 : 3	Consonant
Minor Seventh	**10**	D – **C**	**9 : 5**	**Dissonant**
Major Seventh	**11**	**C** – B	**15 : 8**	**Dissonant**
Octave	**12**	**C** – **C**	2 : 1	Consonant

Of the 12 different intervals, 11 anchor naturally to the tonal centre (the note C) at one end of the scale or the other.

And the only one that doesn't? It's that diabolical *diabolus in musica*, the very devil hisself, the augmented fourth. The one with the weirdest frequency ratio, 45:32.

The same interval can occur in *several places* in one scale. For example, in the C major scale...

- The minor second (one semitone) occurs in two places: E – F, and B – C.
- The perfect fifth (seven semitones) occurs in four places: C – G, D – A, E – B, and F – C.

4.2.9 COMPLEMENTARY INTERVALS

Any two intervals that add up to an octave (which consists of 12 semitones) are called *complementary intervals* (Table 17).

TABLE 17 The Complementary Intervals

Minor 2nd (1 semitone)	+ Major 7th (11 semitones)	= Octave
Major 2nd (2 semitones)	+ Minor 7th (10 semitones)	= Octave
Minor 3rd (3 semitones)	+ Major 6th (9 semitones)	= Octave
Major 3rd (4 semitones)	+ Minor 6th (8 semitones)	= Octave
Perfect 4th (5 semitones)	+ Perfect 5th (7 semitones)	= Octave

A few "rules" of complementary intervals:

- The complement of any minor interval is a major interval. And vice-versa.
- The only two "perfect" intervals—perfect fourth and perfect fifth—complement each other (wouldn't you know it).
- There's no complement for the diabolical tritone (6 semitones).

Complementary intervals are important in understanding chord changes or chord progressions, the subject of Chapter 6.

4.2.10 WHY INTERVALS ARE THE REAL MUSICAL UNITS OF MELODIES AND CHORDS

A tone in isolation is just a tone. Only when two tones are sounded, either together or in sequence, does a relationship form. Your brain analyses that relationship. As each tone sounds in succession, your brain tries to anticipate the new tone that might come next in the context of the ones you've just heard.

If you play a progression of chords without a tune, does your brain interpret that chord progression as "music"?

No, it doesn't.

Hardly ever, anyway. All you hear is formless harmony.

To hear music, *you need a tune*. Your brain demands it. You'll see why in the discussion of harmony, chords, and chord progressions (Chapter 6).

On the other hand, if you play or sing a tune by itself, with no chords, does your brain interpret that tune as "music"?

Yes, it does.

For example, most people sing national anthems without instrumental accompaniment. Great national anthems, such as those of France, Britain, America,

Italy, Russia, and South Africa, have stood the test of time. These anthems have such powerful tunes that they sound beautiful with or without chords.

"O'ER THE LAND OF THE FA-REE-EEE-EEE-EEE-UH"

You've probably heard pop stars perform over-the-top versions of your national anthem. Usually, such renditions ruin the anthem.

When some singer with no compositional know-how deviates from the classic tune of a great national anthem in an effort to "make it his (or her) own," he or she is attempting to re-compose the tune on the fly, incompetently improvising. It's the musical equivalent of painting a moustache on the Mona Lisa.

That said, occasionally a genuine musical genius comes along and succeeds in rendering a national anthem in an awe-inspiring, yet original way. Jimi Hendrix did it at the Woodstock music festival in 1969. But that's rare.

Most of the time, music consists of a tune with instrumental accompaniment. The tune seems to float or bounce along on top of the chords, which provide depth and color. With or without instrumental accompaniment, the tune or melody actually consists of a succession of *intervals*, not a succession of notes.

The first *six* notes of "The Star Spangled Banner"—"O-oh say can you see"—form *five* successive intervals. Here they are (Table 18):

TABLE 18 First Five Intervals of "The Star Spangled Banner"

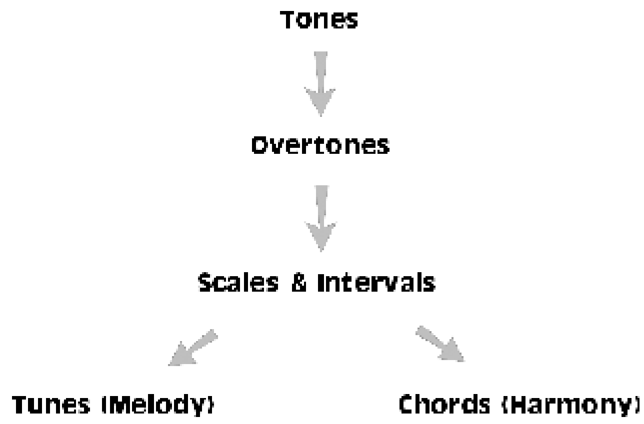
O – oh	**Minor third**, moving down (three semitones)
oh – say	**Major third**, moving down (four semitones)
say – can	**Major third**, moving up (four semitones)
can – you	**Minor third**, moving up (three semitones)
you – see	**Perfect fourth**, moving up (five semitones)

Whether a tune is interesting or boring depends on its arrangement of *intervals*, not individual notes. Intervals come from scales. And scales come from overtones.

Not only that, but, as you'll soon see, intervals determine how *chords* sound, and whether a chord progression imbues a piece of music with purpose and feeling ... or fails to.

Only when you get to intervals does the possibility of music even arise.
Here's a little flow diagram that summarizes these relationships (Figure 17). The arrows mean "give rise to":

FIGURE 17 Pathway to Tunes and Chords



4.3 Interval Dynamics

4.3.1 MUSICAL DRAMA

Recall that an interval is a *relationship* between two pitches. Why the stress on "relationship"? Because that's where the "music" in tunes and harmony comes from. Each note in a scale, and, ultimately, in a tune, sounds restful or restless, relaxed or tense, depending on the note's position with *respect to the other notes* in the scale or tune. These note-to-note relationships, the urges and forces your brain perceives when it hears a tune, are called *interval dynamics*.

> ***The activity that goes on in your brain to process these interval relationships* is *your musical experience.***

In general, if music contains a large amount of unrest as the tune (melody) moves from interval to interval and chord to chord, you have an emotionally charged musical experience.

Intervals perform like the characters in a novel, sit-com, movie, or play. You get interested and emotionally involved in a dramatic story only when you perceive *tension and unrest among the characters*. Similarly when you perceive tension and unrest among the intervals as the tune and chords progress, you experience emotional involvement.

4.3.2 SCALE DEGREES

Figure 18 (below) shows all eight notes of the major scale, beginning and ending with C. However, there are other scales besides the scale of C major. So, to discuss interval dynamics in general, not just for the C major scale, it's necessary to assign *numbers* to each of the tones of the scale.

When you number each note of the diatonic scale, the numbered notes are called *scale degrees*.

FIGURE 18 The Major Scale Showing Scale Degrees (Numbers)

1	2	3	4	5	6	7	1 (8)
C	D	E	F	G	A	B	C

The first and last notes of the scale share the same number, so "(8)" is added to the last note in the following discussion of interval dynamics to distinguish first from last.

Each scale degree has its own name. Only some of these names are important enough to keep in mind, the ones in bold type (Table 19):

TABLE 19 Names of the Scale Degrees

1	**Tonic**
2	Supertonic
3	Mediant
4	**Subdominant**
5	**Dominant**
6	Submediant
7	**Leading Tone**
1 (8)	**Tonic**

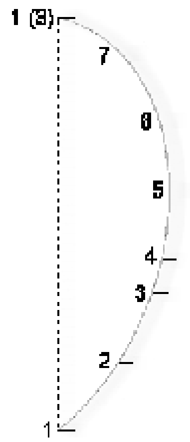
4.3.3 CURVATURE OF THE MAJOR SCALE

How does your mind interpret what you hear when you play a major scale? Call this scale what you like ...

do	re	mi	fa	so	la	ti	do
C	D	E	F	G	A	B	C
1	2	3	4	5	6	7	1 (8)

... it's the same scale. Figure 19 (below) gives you a better visual representation than Figure 18 (above). Here's how your mind actually hears this scale:

FIGURE 19 Interval Dynamics: "Going Away, Then Coming Back"



You hear the pitch rising higher and higher as you proceed upwards through the scale degrees, from 1 to 2 to 3 to 4, all the way up to 1 (8).

Or you hear the pitch falling as you proceed downwards from 1 (8) to 7 to 6 to 5, all the way down to 1.

As you proceed upwards through the scale degrees, each tone sounds like it's not only ascending in pitch, but also moving *further away* from the vertical line that runs through 1 and 1 (8).

Then, when you get to scale degree 5, something happens. *The direction of motion reverses*. And, although the pitch continues to rise, the tones sound like they're somehow returning home, towards 1 (8).

And yet, it's a different version of home, a different version of the tonal centre.

Oddly, you get this "going away, then coming back" sensation whether you ascend the scale from one end to the other, or descend it from one end to the other.

4.3.4 INTERVAL DYNAMICS: CURVED ARROWS THROUGH YOUR BRAIN

The following discussion pertains to interval dynamics in tunes *without chords*. Tunes *with harmony* are discussed in Chapters 6 and 9.

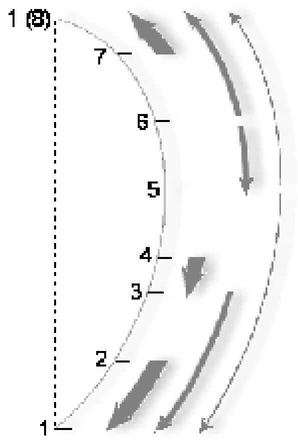
When you play a single note, that's all your brain perceives. Just a note. Not music (ignoring, for the time being, the tiny little matter of rhythm). But when you play at least two successive notes that are different from each other—an interval—suddenly you have at least the possibility of music.

In Figure 20 below, the arrows show the tensions, the unrest your brain perceives in the relationships between the tones (that is, the intervals), as you play the scale up or down.

The term *interval dynamics* refers to the fact that, once your brain understands which note is the tonic note, it perceives the succession of tones as *energized, dynamic players that move in force fields*—not as static, lifeless beads on a string. Without interval dynamics, there'd be no music.

In Figure 20, the thicker the arrow, the greater the dynamic tension or unrest.

FIGURE 20 Interval Dynamics: How Your Brain Actually Hears the Major Scale



4.3.5 INTERVAL DYNAMICS: MUSICAL ROAD TRIPS

Recall that simple ratios of frequencies gave rise to a scale in the first place. However, some frequency ratios within the scale are simpler than others. When your brain

hears two frequency ratios, one simple, the other not-as-simple, it perceives an urging of the not-as-simple frequency ratio to become simpler. That's the onset of a tune.

As the tune moves from note to note, your brain stays interested only if most of the ratios of frequencies do not resolve to simpler ones, while holding the promise of ultimately resolving.

To get a tune started, you need a minimum of *two* frequency ratios so that your brain can tell which one is simpler than the other. This can happen only if you hear at least *three successive notes*:

- A *single* frequency ratio is a ratio of two different notes (one interval).

- Therefore two frequency ratios require at least three notes (two consecutive intervals).

Every interval except the octave creates tension or unrest. This tension creates a musical story line or *musical narrative,* as musicologists call it, especially when referring to long-form instrumental works, such as symphony movements. Here's how Anthony Storr describes the nature of musical adventuring:

> Hero myths typically involve the protagonist leaving home, setting out on adventures, slaying a dragon or accomplishing other feats, winning a bride, and then returning home in triumph ... The end of the piece is usually indicated by a return 'home' to the tonic; most commonly to the major triad, less commonly to the minor. A hero myth is an archetypal pattern, deeply embedded in the psyche, because it reflects the experience of nearly all of us. We all have to 'leave home' by severing some of the ties which bind us to it ...

Musical narratives apply to any musical form, including short songs. Here are three of many versions:

1. ***"The Muso of Oz" story line.*** The protagonist leaves Kansas—the tonic note, the first note of the scale—on a mysterious journey. Immediately, tension arises (the curved arrows in Figure 20), and the tune finds itself on a yellow brick road trip, trying find its way back home.

   Will the tune find its way back home? Will it run into more tension and unrest before it finds its way home? Will it get hopelessly lost and have to rely on Marshal Puma to dispatch Doc and Fester, neither of whom can even stay upright on a horse?

   Usually, the tune does find its way back to tonic Kansas. End of tune.

2. ***"The Escapee" story line.*** The protagonist moves through various dynamic tonal fields, hiding, disguising itself, trying to escape re-capture.

   Will the fugitive, Dr. Richard Cymbal, get caught somewhere along the road and hauled back to Tonal Headquarters to face the music? Will everything somehow resolve in a Hollywood ending of dramatic climax, car chases, explosions, truth, and justice?

   Yes, of course. End of story and tune.

3. ***The "Lord of the Tunes" story line.*** The protagonist is the sovereign, the queen or king (could it be Elvis?), the holder of authority over the tune.

   The plot concerns itself with the loss and regaining of rightful authority. The sovereign's source of authority, the Tonic Note, somehow passes into the possession of other notes. The story is still a road trip—a tune would not be a tune if it didn't move continuously and, to a degree, restlessly. The identity of the holder of sovereignty gets called into question.

   Will the rightful sovereign get back sovereignty? Yes, usually. End of story and tune.

Every tune's a road trip. If the tune's really short, the story's over in seconds (for example, numerous nursery tunes). If the tune takes a lot of twists and turns, the story might go on for 20 minutes before the tune finally finds its way back home (a symphonic movement).

4.3.6 INTERVAL DYNAMICS: CURVED ARROWS AND CONTEXT

Music arises when your brain compares frequency ratios of a succession of notes, an order of intervals. That means your brain needs context. If it's a tune without chords, the first note you hear supplies the beginning of context. The second note provides more information. The third, still more information. And so on.

All the while, your brain is comparing frequency ratios. If it perceives several different simple frequency ratios (for example, 2:1, 3:2, 4:3, etc.) among the note relationships (i.e., the intervals), it figures out there's an organizing principle at work that is giving rise to the succession of simple frequency ratios it's perceiving.

What is this organizing principle?

A scale of some sort.

It then expects to hear more notes from the same scale, but not necessarily in the same order.

In fact, your brain will get bored and lose interest in the tune unless it perceives some surprises in the relationships between the pitches (the intervals) as the tune moves on.

As soon as the tune begins (sets the musical road trip in motion), your brain goes to work figuring out which note is the tonic—the tonal centre. All of the frequency ratios that define the other intervals depend on the tonal centre for context. The *tonic note* acts as a kind of gravitational force on the tune as a whole, which is why it's called the tonal centre.

Your brain perceives a hierarchy of stability, with scale degree 1 (the tonic note) perceived as most stable.

THE MUSICAL ADVENTURES OF "TRITONE," THE CAT

As discussed in Chapter 1, chimpanzees create abstract paintings that sell for big bucks.

So, why couldn't a talented cat compose music on the piano? If people buy chimp paintings, somebody might buy cat music.

Marshal Puma inherited a piano-playing cat after Ex-Marshal McDillon left town in a ball of feathers and humiliation. The cat, Tritone, walks along Marshal Puma's piano keyboard.

Yes, but is it music?

Your brain hears a succession of random notes and can't figure out which one is the tonal centre. Therefore, it can't apply an organizing principle—a scale—to the notes it hears. So it can't make sense of any of the intervals Tritone is playing.

Not only that, but Tritone, being a cat, has no ability to entrain. So he can't even walk along the keys in a recognizably rhythmic style. Still, people do pay thousands of dollars for chimpanzee paintings. Who knows, Marshal Puma might want to record Tritone's piano playing and send a demo to a record label in some other city, such as Wichita or even Austin. One that specializes in postmodern music.

Here's another way of looking at the way the tones of the major scale gravitate towards the tonal centre (Figure 21):

FIGURE 21 Interval Dynamics: "Gravitational Force" of the Tonic Note

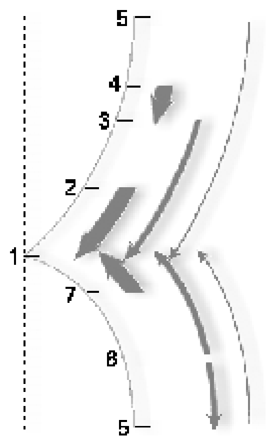


Figure 21 illustrates the appropriateness of the term "diatonic." All the notes of this type of scale ultimately relate to each other *diatonically*—"through" or "by" the "tonic" note.

When you play a simple major scale, how does your brain automatically figure out and interpret what it's hearing? Table 20 below shows the basics. You need context. Your brain needs to process all of the notes successively for you to feel these effects.

TABLE 20 Interval Dynamics, Major Scale

Note Movement	Interval Name	Fig. 20 Graphic	State of Unrest/Tension (with Respect to Tonic Note)
1 – 2	Major second (whole tone)	Thick arrow	Upper note of major second (frequency ratio of 9:8) seeks to resolve down to the tonal centre. Motion against the natural force, 1 – 2, creates high tension. Motion with the natural force, 2 – 1, resolves it.
4 – 3	Minor second (semi-tone)	Thick arrow	Upper note of minor second (frequency ratio of 16:15) seeks to resolve down to the closest note, scale degree 3, with its much simpler frequency ratio of 5:4 with respect to the tonal centre. Motion against the natural force, 3 – 4, creates high tension. Motion with the natural force, 4 – 3, resolves it.
7 – 1 (8)	Minor second (semi-tone)	Thick arrow	Lower note of minor second (frequency ratio of 16:15) seeks to resolve up to the tonal centre. Motion against the natural force, 1 (8) – 7, creates high tension. Motion with the natural force, 7 – 1 (8), resolves it.
3 – 1	Major third	Medium arrow	Upper note of major third (frequency ratio of 5:4) seeks to resolve down to the closest tonal centre. Motion against the natural force, 1 – 3, creates moderate tension. Motion with the natural force, 3 – 1, resolves it.

6 – 5 or 6 – 1 (8)	Minor second or Minor third	Medium arrow	Scale degree 6 has a roughly equal urge to resolve either down to the simpler frequency ratio of the nearby scale degree 5, or up to the closest tonal centre. Motion against the natural forces, 5 – 6 or 1 (8) – 6, creates moderate tension. Motion with the natural forces, 6 – 5 or 6 – 1 (8) resolves it.
5 – 1 or 5 – 1 (8)	Perfect fifth or Perfect fourth	Thin arrow	Scale degree 5 has a only a slight but roughly equal urge to resolve to either tonal centre. Motion against the natural forces, 1 – 5 or 1 (8) – 5 creates slight tension. Motion with the natural forces, 5 – 1 or 5 – 1 (8) resolves it.

Your brain perceives all of the notes except the tonal centres, 1 and 1 (8), in some state of unrest as you play the scale. You can use any of several terms to characterize these interval dynamics:

restless vs at rest

unbalanced vs balanced

tense vs resolved

unstable vs stable

dissonant vs consonant

The instant these forces come into play—the instant you hear a *series* of notes played or sung (a succession of intervals)—your brain may sense a tune (musical motion). It depends on the frequency ratios of the intervals and whether or not your brain can sense in those intervals an underlying organization.

Your brain automatically tries to determine if the intervals correspond to simple ratios of frequencies. It will also try to determine the tonal centre, the note that serves as the anchor for purposes of identifying the simple ratios. If it identifies several familiar simple frequency ratios, it instantly understands the organizing principle (a diatonic scale) and perceives some sort of tune—a succession of intervals manifesting a variety of levels of dynamic tension.

4.3.7 INTERVAL DYNAMICS: MANIPULATING TONAL TENSION

Just as a writer of a movie script or play manipulates tension through the actions of characters, a composer or songwriter manipulates tension through the actions of intervals. Some intervals deliver more tonal tension than others.

Normally, a composer or songwriter comes up with a tune without intellectualizing about it. The tune just comes out as an effusion. However, like any good writer, a skilled songwriter or composer will then go over the tune and recognize weak spots—places where the tune drags (not enough high-tension intervals), or becomes confusing (too much material for short-term memory to handle), as it moves from note to note.

A knowledge of interval dynamics becomes vital in revising the tune. Historically, great composers (e. g., Beethoven) and songwriters (e. g., Leonard Cohen, Paul Simon), have sweated over revisions until they sense the tune has its own identity and doesn't get tired-sounding, even after repeated listenings.

Any tune retains a distinct identity no matter where it's played or sung in the spectrum of pitches. Therefore, any pitch whatsoever can serve as the tonal centre, the tonic note. It's the frequency *ratios* that matter, not the specific frequency that serves as the foundation (tonic note) for determining the ratios.

The intervals with the simplest frequency ratios have the lowest dynamic tension, the greatest stability. The octave, with a frequency ratio of 2:1, is, of course, the most stable interval.

The perfect fifth, with its 3:2 frequency ratio, has little inherent tension, and therefore serves as a kind of counter terminus to the tonic notes at either end of the scale. The perfect fifth has so much natural stability that many tunes end on it (instead of the tonic, which is where most tunes end), and the listener does not feel as though the tune has failed to come to rest.

At the other extreme, the minor second can supply a lot of tension, especially in its role as scale degree 7 going up to 1 (8). Because scale degree 7 strongly seeks to resolve up to 1 (8), scale degree 7 is known as the *leading tone*.

It's important to reiterate that your brain does not "learn" any of this. It's hard-wired. You will always sense these states of rest or unrest, tension or resolution, etc., whenever you hear a variety of simple ratios of frequencies in succession.

4.3.8
THE TYRANNICAL OCTAVE

You don't have to think of the octave as tyrannical. But, like other natural phenomena (gravity, for instance), it is. As Figure 20 above illustrates, all arrows curve to the octave notes. In music, you can't break free of the tyrannical octave.

No matter how hard your tune may try to break the chains of 1 and 1 (8), there's just no escaping. Your tune merrily leaves home, lights out for the territory, and ends up ... where? Strangely, back home. Without having turned back. Without having gone in a circle.

The irreducible simplicity of the 2:1 (octave) frequency ratio induces a feeling of balance or repose. All other pitches arise from more complex frequency ratios such as 3:2, 4:3, 5:4, and so on. Your brain distinguishes them from the octave interval notes in two ways:

1. By associating a "different-from-octave" *qualitative sound* with each note representing each "non - 2:1" frequency ratio, within the context of the octave interval.

   For example, as you play the white keys on the piano from C up to the next C, you hear the notes D, E, F, G, A, and B all sounding *qualitatively different* from the C you started the scale with.

   But when you get to the C at the top of the scale, even though it's a different note, it sounds *qualitatively the same* as the C you started with. Yes, it's higher in pitch, but it still sounds to your brain like the identical note you started with, C.

2. By associating a feeling of *imbalance or unrest* with each *non-octave* note. This feeling of unrest or tension increases in intensity as frequency ratios become more complex with respect to the octave interval.

You can stuff as many notes as you want between 1 and 1 (8), but you still won't escape the octave. You can never pry the octave open any wider, because you can't reduce a frequency ratio to anything simpler than 2:1.

Paradoxically, making peace with the smallest intervals of the octave, the semitones (through a bit of fudging called equal temperament), provides more than ample relief, if not escape, from the octave's tyranny (coming up in Chapter 5).

(Tuning purists will note that some tuning systems slightly "stretch" the octave, such as one used by Indonesian Gamelan percussion orchestras. But such tunings are highly variable and, in any case, unheard of in Western popular music.)

4.4 Emotional Effects of Intervals

Table 21 below lists some reported emotional effects of various types of intervals, and specific intervals.

Keep in mind that the emotional effects of the intervals listed below, like the emotional effects of other musical elements, vary with the musical context—the succession of preceding intervals, the prevailing chords and chord changes, rhythmic variables, instrumental tone colors, and so forth.

TABLE 21 Emotional Effects of Intervals

Interval or Interval Type	Associated Emotions
Consonant intervals	Pleasantness, generally positive emotional valence; not as strong or active as dissonant intervals
Dissonant intervals	Generally negative emotional valence, strength, activity
Major intervals	Brightness, strength
Minor Intervals	Dullness, weakness
Large intervals	Power
Small intervals	Weakness
Minor second	Melancholy, displeasure, anguish, darkness
Major second	Pleasurable longing, displeasure (neutral as a passing tone; see Chapter 9)
Minor third	Tragedy, sadness
Major third	Joy, happiness, brightness
Perfect fourth	Buoyancy, pathos (neutral as a passing tone; see Chapter 9)
Tritone (*diabolus in musica*)	Violence, danger, tension, devilishness (of course!)

Perfect fifth	Cheerfulness, stability
Minor sixth	Anguish, sadness
Major sixth	Winsomeness, pleasurable longing (neutral as a passing tone; see Chapter 9)
Dominant seventh	Irresolution, displeasure, mournfulness
Major seventh	Aspiration, displeasure, violent longing
Octave	Lightheartedness (i.e., sudden melodic leap)

5

How Keys and Modes REALLY Work

Art is the opposite of chaos. Art is organized chaos.
—IGOR STRAVINSKY

5.1 Scales from Around the World

5.1.1 What Scales Have In Common: Tones In Simple Frequency Ratios

Thousands of years ago in Africa, Europe, Asia and elsewhere, people made discoveries, independently, about the connections between tunes (songs) and scales (ordered collections of pitches used in the tunes). Some scales eventually fell out of use. Others became fixtures of the prevailing culture.

All musical-sounding scales consist of a small selection of notes—typically five to seven intervals (six to eight notes) to the octave. The notes that comprise scales everywhere tend to have simple frequency ratio relationships with the *first note* of the scale. You can play most widely-used musical scales on a piano or guitar, regardless of the scale's culture of origin.

THE MEANING OF "OCTAVE"

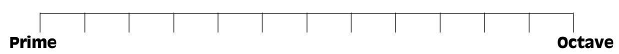
The term "octave" originally described the span of the eight-note (seven-interval) diatonic order of tones and semitones. Now the term simply applies to the interval associated with the frequency ratio 2:1.

So, whether a scale has five, six, seven, eight, thirteen, or twenty-two notes, the span from the lowermost to the uppermost note—the note with a frequency of double the lowermost note—is still referred to as an "octave."

Figure 22 below shows the chromatic scale. It's just a rack of 12 equally-spaced semitone intervals—13 notes, including the tonic notes at each end, called the *prime* (or *interval of unison*) and the *octave*.

To play the chromatic scale, you start with any note and simply play adjacent semitones until you get to the next octave note. Postmodern feline composers the world over use this non-musical scale.

FIGURE 22 Chromatic Scale



The scales in the following discussion use a variety of samplings of tones from the chromatic scale.

5.1.2 MAJOR PENTATONIC SCALE

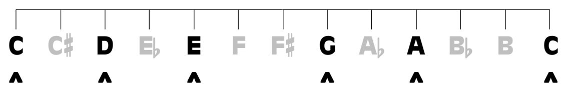
You will find this Pythagorean scale in every major musical culture worldwide. The name *penta*tonic derives from the fact that it has five *intervals,* although the scale has six *notes*, including the prime and the octave.

You can play this scale on your guitar or keyboard starting from any note, as long as you preserve the *interval order*, like this (the dots indicate the notes; the labels between indicate the type of interval between notes):

● tone ● tone ● aug 2nd ● tone ● aug 2nd ●

Figure 23 clarifies which tones you would select from the chromatic scale to get the major pentatonic scale, and the size of the intervals from tone to tone.

FIGURE 23 Major Pentatonic Scale (5 Intervals, 6 Notes)



This scale is widely used in Africa and Asia (it's the Chinese Mongolian scale), in Celtic music, and in North American folk, gospel and blues music. Some familiar songs that use the major pentatonic scale are:

- "Auld Lang Syne"
- "Swing Low, Sweet Chariot"
- "Amazing Grace"

Here's an easy way to remember the interval order for this important scale: play the *black keys only* on the piano, starting with F♯ (that's the first (leftmost) key in the group of three black keys).

5.1.3 MINOR PENTATONIC SCALE

The minor pentatonic scale (Figure 24 below) uses the same notes as the major pentatonic scale, but in a different order. The interval order is as follows (5 intervals, 6 notes):

● aug 2nd ● tone ● tone ● aug 2nd ● tone ●

To remember the interval order for this scale, play the black keys only on the piano, starting with D♯ (that's the second—rightmost—key in the group of two black keys).

FIGURE 24 Minor Pentatonic Scale (5 Intervals, 6 Notes)

A	B♭	B	C	C♯	D	E♭	E	F	F♯	G	A♭	A
^			^		^		^			^		^

Both the major pentatonic and the minor pentatonic scales use the same five black keys on the piano. Each scale has the same number of "tone" intervals (three), and the same number of "augmented 2nd" intervals (two). Yet these two pentatonic scales sound markedly different from each other. How come?

Because, with any scale, each of the constituent tones forms an interval with the *tonic note*. So, if you change the *order* of the intervals, you change the character of the entire scale. Even if you use the *same number* and *same sizes* of intervals.

It goes back to ratios of frequencies.

Each tone of a scale has a unique frequency ratio with respect to the *tonic note*. If you move *even one tone* to a different position within a scale, you change its frequency ratio with respect to the tonic note—and with all the other notes in the scale. This changes the sound of the entire scale. Consequently, it changes the character of melodies crafted using the scale.

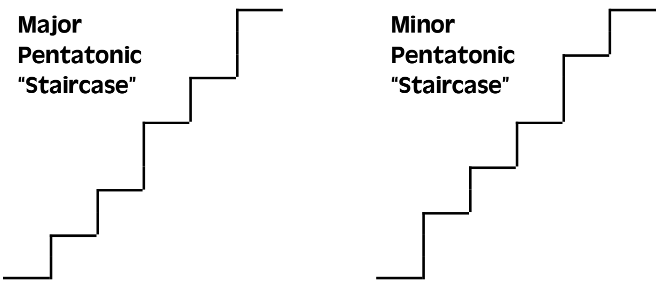
In other words, if you move even one tone in a scale, it becomes a *different scale* with *different melodic potential*.

5.1.4 WHY "SIMILAR" SCALES SOUND SO DIFFERENT: THE STAIRCASE ANALOGY

Think of staircases with differing heights of the individual steps. The floor at the bottom of the staircase represents the tonic note. The upper floor is the octave note. The *intervals* are the vertical distances you go as you climb the steps. Each staircase is the same overall height, connecting the lower floor to the same upper floor.

Figure 25 visually represents the difference between the major pentatonic and minor pentatonic scales.

FIGURE 25 Scales As "Staircases"



Even though both pentatonic staircases have three regular-sized steps and two large steps, the difference in the *order* of the two step sizes means you have a different experience climbing each staircase.

Just as re-ordering step-sizes makes for unique staircases and climbing adventures, so re-ordering intervals makes for unique scales and musical experiences.

A HORSE-FRIENDLY HOTEL WITH CHROMATIC STAIRCASES

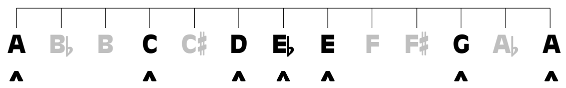
WARNING: DO NOT try to ride your horse up a pentatonic staircase. As you can see in Figure 25 above, a pentatonic staircase is too steep, and the steps are too uneven. Ex-Marshal McDillon had to ban horses from all the hotels in Dodge City because so many horses got hurt on the pentatonic staircases. Marshal Puma has decided to keep the ban in place, despite her falling out with Ex-Marshal McDillon and her affinity for cheap plot twists in Classic Westerns.

If you're looking for a horse-friendly hotel, try the Fairmont Royal York, a luxury hotel in Toronto, Ontario, Canada. Since the late 1940s, the Fairmont Royal York has welcomed strangers from the West, especially strangers from Calgary, Alberta, Canada, to ride on up to the registration desk on their horses. According to some reports, this policy also applies to chuckwagon drivers with teams of horses. The hotel even has specially-constructed smooth chromatic staircases to make it easy for guests on horseback to get around inside the hotel.

5.1.5
Blues Scale

The blues scale (Figure 26 below) is almost the same as the minor pentatonic scale, except that it has an extra note in the middle. The addition of that extra note, sometimes called a *blue note*, gives this scale a considerably different sound from the minor pentatonic.

FIGURE 26 Blues Scale (6 Intervals, 7 Notes)



5.1.6
An Arabic Scale

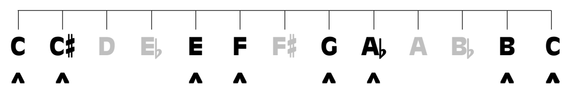
Figure 27 below shows a scale used in the Middle East. Try playing it on your guitar or piano.

Compare this Arabic scale with the familiar major diatonic scale (all the white keys on the piano, beginning with C). The Arabic scale has four semitone intervals, including two consecutive semitones as you pass through the tonic note. These dissonances give the scale an exotic, other-worldly sound to Western ears.

You can play this scale starting with any note on your guitar or piano. As usual, just make sure you preserve the *order of the intervals*, like this:

● semitone ● aug 2nd ● semitone ● tone ● semitone ● aug 2nd ● semitone ●

FIGURE 27 An Arabic Scale (7 Intervals, 8 Notes)



5.1.7 INDIAN OR WHOLE TONE SCALE: AN EQUAL-INTERVAL SCALE THAT WORKS

Normally, an equal-interval scale sounds like rubbish. But here's an Indian equal-interval scale that sounds musical (Figure 28). It has a dream-like, fanciful quality. Almost surreal.

This scale contains consonant intervals with simple frequency ratios (major thirds, minor sixths) and dissonant intervals (major seconds, tritones, minor sevenths).

This whole tone scale below is one of many scales used in Indian music. Another divides the octave into 22 "microtones"—intervals smaller than a semitone.

Impressionist composers such as Claude Debussy used the whole tone scale in many compositions.

FIGURE 28 An Equal-interval Indian or Whole Tone Scale (6 Intervals, 7 Notes)

C	C♯	D	E♭	E	F	F♯	G	G♯	A	A♯	B	C
^		^		^		^		^		^		^

5.1.8 A CHINESE PENTATONIC SCALE

The major pentatonic scale (Figure 23 above) is the same as the Chinese Mongolian scale.

The following pentatonic scale is also widely used in China (Figure 29):

FIGURE 29 A Chinese Scale

C	C♯	D	E♭	E	F	F♯	G	A♭	A	B♭	B	C
^				^		^	^				^	^

5.1.9
HUNGARIAN GYPSY (ROMA) SCALE

And, finally, to get your blood a-boilin', here's the Hungarian minor scale, better known as the Hungarian Gypsy scale or the Hungarian Roma scale (Figure 30).

Get somebody to play a fast tune with this scale. Dance until dizzy.

FIGURE 30 Hungarian Gypsy (Roma) Scale

C	C♯	D	E♭	E	F	F♯	G	A♭	A	B♭	B	C
^		^	^			^	^	^			^	^

5.2
The Modes: Scales of the Diatonic Order

5.2.1
THE DIATONIC ORDER: A DISTINCTIVE PATTERN OF TONES AND SEMITONES

Chapter 4 discussed how the major diatonic scale with which Westerners are so familiar developed from the application of simple ratios of frequencies.

Historically, this scale did not emerge quickly or easily. The "do-re-mi" major scale pattern of five tones and two semitones took centuries of tinkering. Recall from Chapter 4 the order of tones and semitones for the major scale—the white keys on the piano beginning and ending with C:

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

Two whole tones, then a semitone, then three whole tones, then another semitone: this pattern of tones and semitones is called the *diatonic order*.

5.2.2 FLAVOURS OF THE DIATONIC ORDER

Now, suppose that, instead of playing

C – D – E – F – G – A – B – C,

you were to start on a different white key of the piano, such as D, like this:

D – E – F – G – A – B – C – D.

The pattern of tones and semitones shifts to:

● tone ● semitone ● tone ● tone ● tone ● semitone ● tone ●

Is this still the so-called "diatonic order"?

Yes it is. You still have five tones and two semitones. They're still spaced the same way.

But when you play this scale, it no longer sounds like the familiar "do-re mi" scale. It sounds a little weird, a little strange. By starting on a different note—D—you change the *order of the frequency ratios* of several of the notes of the scale *with respect to the tonal centre.*

It's a different staircase.

Recall the pattern of curved arrows near the end of Chapter 4, representing the dynamic relationships among the tones that make up the "do-re-mi" major scale. That pattern of curved arrows does not apply to this new scale.

Suppose you were to play all the white keys starting with E, like this:

E – F – G – A – B – C – D – E.

Now the pattern has shifts to:

● semitone ● tone ● tone ● tone ● semitone ● tone ● tone ●

Again, it's the diatonic order: five tones and two semitones, all spaced the same way. But again, with a different tonal centre, this scale sounds different from both the C-based scale and the D-based scale. The E-based scale sounds Spanish. Or maybe Middle Eastern.

You can keep doing this, playing a different scale on the white keys only, starting on a different key each time—a different tonal centre each time.

Next comes this one:

F – G – A – B – C – D – E – F

Then:

G – A – B – C – D – E – F – G

Then:

A – B – C – D – E – F – G – A

And finally:

B – C – D – E – F – G – A – B

At this point, you've run out of scale possibilities—the next one would be a repetition of the C-based scale, the one you started with.

So ... seven variants of the diatonic order, each starting on a different white key of the piano. What's the musical significance?

5.2.3
CHURCH A LA MODE

When the diatonic order was being sorted out several centuries ago, composers and musicians were working with many scales. But it took quite a while to settle on one or two favourites, for reasons ultimately having to do with simple frequency ratios, harmony, and something called tonality (coming up later in this chapter).

In medieval times, there were eight modes called the Church modes or Gregorian modes. As the diatonic order gradually became more entrenched, seven "modern" modes were recognized—the seven variants of the diatonic order you just played on the keyboard, each beginning on a different white key.

The seven modes have names. The scale you get when you play the white keys on the piano starting and ending with C is called the *Ionian mode*. The modern name for the Ionian mode is simply the *major scale*—your basic familiar "do-re-mi" scale.

The scale you get when you play the white keys on the piano starting and ending with D is called the *Dorian mode*. And so on.

You can play any of these modal scales anywhere on your guitar or piano (i.e., starting on any note), as long as you *preserve the interval order* for the mode.

Figure 31 below shows all seven modes and the interval orders for each. These modes will be referred to henceforth as the "Church modes" (which will no doubt irritate some history-of-music-theory purists). Note that in Figure 31

T = Tone
S = Semitone

FIGURE 31 The Seven Church Modes (7 Intervals, 8 Notes), Each a Different "Cut" of the Diatonic Order

Ionian Mode (now known as the major scale)

C C♯ D E♭ E F F♯ G A♭ A B♭ B C
^ ^ ^ ^ ^ ^ ^ ^
T T S T T T S

Dorian Mode

D E♭ E F F♯ G A♭ A B♭ B C C♯ D
^ ^ ^ ^ ^ ^ ^ ^
T S T T T S T

Phrygian Mode

E F F♯ G A♭ A B♭ B C C♯ D E♭ E
^ ^ ^ ^ ^ ^ ^ ^
S T T T S T T

Lydian Mode

F F♯ G A♭ A B♭ B C C♯ D E♭ E F
^ ^ ^ ^ ^ ^ ^ ^
T T T S T T S

Mixolydian Mode

G A♭ A B♭ B C C♯ D E♭ E F F♯ G

T T S T T S T

Aeolian Mode (now known as the natural minor scale)

A B♭ B C C♯ D E♭ E F F♯ G A♭ A

T S T T S T T

Locrian Mode

B C C♯ D E♭ E F F♯ G A♭ A B♭ B

S T T S T T T

5.2.4
SOME POPULAR SONGS WITH CHURCH MODE MELODIES

Of the seven Church modes, two are no longer thought of as such—the Ionian and Aeolian modes—because the great majority of the music of the West uses these two scales, now called the *major* and *minor*, respectively.

As for the other Church modes, they faded into disuse roughly around the Shakespearean era, some 400 years ago. Today, you can hear some of the Church modes in some genres, such as heavy metal, some British and Celtic folk music, and some so-called "art" music.

Chapter 6 discusses the inherent properties of the Church modes that make it difficult for musicians to use them to create palatable chord progressions. Chapter 9 discusses how you can use Church mode scales to create compelling melodies, while using chord progressions derived from the two modes now referred to as the major and minor scales.

The Church modes have occasionally found their way into popular songwriting. Here are a few examples of tunes that use Church modes as scales (some recordings of these songs may be in keys other than the original modal key):

Dorian mode (D to D, white piano keys only)

- "The End" (The Doors)
- "What Shall We Do With A Drunken Sailor" (traditional)
- "Scarborough Fair" (folk song popularized by Simon and Garfunkel)
- "Smoke On The Water" (Deep Purple)
- "The Way I Feel" (Gordon Lightfoot)
- "Green Onions" (Booker T & the MG's)
- "Oye Como Va," "Evil Ways," and numerous others as performed by Carlos Santana ("King of the Dorian Mode")

Phrygian mode (E to E, white piano keys only)

- "White Rabbit" (Jefferson Airplane)

Lydian mode (F to F, white piano keys only)

- "The Simpsons" theme

Mixolydian mode (G to G, white piano keys only)

- "Norwegian Wood" (The Beatles)
- "Satisfaction" (Rolling Stones)
- "The Wreck of the Edmund Fitzgerald" (Gordon Lightfoot)
- "Sweet Home Alabama" (Lynyrd Skynyrd)

If you're unfamiliar with some of these songs, go to the *Gold Standard Song List*. The website (www.GoldStandardSongList.com) has details on how to get the lyrics and how to listen to excerpts.

Locrian mode (B to B, white piano keys only)

- The Locrian is a theoretical mode, too unsettled-sounding for practical melodic use. It differs from all of the other modes in that its fifth degree is not

a perfect fifth interval (which usually imparts some cohesion to a scale). It's a *diminished fifth*—the dreaded tritone.

5.2.5 More Scales Than a Catfish (2,047 to be Exact)

In theory, how many different scales could there be?

More than you'll find on the skin of your average catfish.

Why so many?

Because scales are *combinatorial*. You start with a finite number of items (all the notes of a chromatic scale), plus some rules about picking and combining the items (the notes you choose from the chromatic scale to make up your own scale). The more notes in your original chromatic scale, the more "sub-scales" you can create.

Here are some scale construction "rules":

- Start with an equal-interval chromatic scale. It can have any number of notes, up to a maximum of, say, 30 in the octave. (The more notes to the octave, the harder it is for your brain to distinguish adjacent notes.) In the diatonic system, there are only 13 notes in the chromatic octave, including the first and last notes. But other musical systems divide the octave into more than 13 notes. In theory, you could start with a chromatic scale of, say, 30 notes to the octave, instead of 13.

- Pick any number of notes from the chromatic scale to create a scale of your own. However, your scale must have a *minimum* of three notes—the first and last notes of the octave, plus one other note in between. The *maximum* number of notes would be all the notes in the full chromatic scale.

- The scale must be confined to one octave, with no notes repeated except the prime and octave notes at each end.

Suppose you start with a *chromatic* scale of only three notes. Call the notes A, B, and A, where the two "A" notes are the notes at each end of the scale. According to the above rules, you could only have one scale, comprised of three notes.

A B A

Now suppose you start with a chromatic scale of four equally-spaced notes, A, B, C, and A (three equal intervals). According to the rules, you could create two scales comprised of three notes and one scale with four notes:

A B A
A C A
A B C A

Next, start with a chromatic scale of 5 equally-spaced notes, A, B, C, D, and A. The number of possible scales you could create more than doubles to seven:

A B A	A B C A	A B C D A
A C A	A C D A	
A D A	A B D A	

Next, try a chromatic scale of 6 notes, A, B, C, D, E, and A. The number of possible scales more than doubles again, to 15:

A B A	A E A	A B E A	A D E A	A B C E A
A C A	A B C A	A C D A	A B C D A	A B D E A
A D A	A B D A	A C E A	A C D E A	A B C D E A

And so it goes:

Chromatic scale of 7 notes = 31 possible scales
Chromatic scale of 8 notes = 63 possible scales
. . .
Chromatic scale of 13 notes = 2,047 possible scales

As you know, the chromatic scale of 13 notes is the one from which all Western musical scales are drawn. Here's a breakdown of the 2,047 possible scales you can create using the 13-note (12 semitone) Western chromatic scale (Table 22):

TABLE 22 Number of Possible Scales Using a 13-Note, 12-Interval Chromatic Scale

Number of Notes in the Scale	Number of Possible Scales
3	11
4	55
5	165
6	330
7	462
8	462
9	330
10	165
11	55
12	11
13	1

	2,047

So ... the familiar 8-note "do-re-mi" major scale is only one of 462 possible 8-note scales you could construct by selecting 8 notes from the 13-note chromatic scale.

There are 330 possible pentatonic scales. (Recall that the number of *notes* in a pentatonic scale is not five; it is six, because the octave note occurs twice.)

Of all the 2,047 possible scales, only a small number lend themselves easily to modulation (key changes) and harmony. Those are the ones you'll find most useful.

Roedy Black's *Guitar and Keyboard Scales Poster*, available at www.CompleteChords.com, displays guitar and keyboard fingering diagrams in all keys for five of the most useful, commonly used scales:

- Major scale
- Minor scale
- Major pentatonic scale
- Minor pentatonic scale
- Blues scale

Now, just for fun ...

Q: How many scales could you theoretically create if you started with a chromatic scale of 30 notes to the octave?

A: Precisely 268,435,455 possible scales. When you die, if there is a hell, and you end up there because you've been bad, they will have a 30-note chromatic scale. You will have to memorize all the possible scales you could create from it. On the other hand, if you've been good and you go to heaven, you will meet Maurice Ravel, who will try to get you interested in learning how to compose heavenly music with the whole tone scale, which you may or may not find appealing, depending on how long eternity lasts.

5.2.6 WHY THE CHURCH MODES DIDN'T MAKE THE BIG TIME

For purposes of creating harmony, the five Church modes that fell into disuse lacked the vigour and dynamism of the scales that stuck around.

A "successful" scale (as far as your brain is concerned) needs a mixture of two kinds of intervals:

1. **Easily-processed simple-frequency-ratio intervals.** These intervals provide your ear with a sense of tonal recognition, a "home," a centre of gravity.

   A note associated with the next-simplest frequency ratio after the octave, namely, ratio 3:2 (scale degree 5) must be positioned in the middle of the scale. It functions as a stable counterweight to the tonic note.

   At scale degree 5, a tune has travelled as far away from "home" as it can get. Now it can only proceed either downwards towards scale degree 1, or upwards towards scale degree 1 (8).

   Table 23 shows the first few overtones in the harmonic series—the strongest overtones. You can see that the overtones with frequency ratios associated with the *consonant* scale degrees, 1 and 5 especially, and also 3, appear most prominently.

   Only at the sixth overtone does a dissonance finally make an appearance. More on these phenomena in Chapter 6.

TABLE 23 Fundamental and First 9 Overtones of the "Middle C" Overtone Series

Tone / Overtone	Multiple of Fundamental	Frequency Ratio	Associated Scale Degree
Fundamental	1 (f)	1 : 1	1
1st Overtone	f x 2	2 : 1	1
2nd Overtone	f x 3	3 : 2	5
3rd Overtone	f x 4	2 : 1	1
4th Overtone	f x 5	5 : 4	3
5th Overtone	f x 6	3 : 2	5
6th Overtone	f x 7	9 : 5	♭7
7th Overtone	f x 8	2 : 1	1
8th Overtone	f x 9	9 : 8	2
9th Overtone	f x 10	5 : 4	3

2. **Highly unstable, unbalanced intervals, especially a "leading tone."** They function as pointers, directly or indirectly, to "home." In particular, a highly unbalanced interval between scale degrees 7 and 1 (8) is required to propel the tune upwards to that "home on high," scale degree 1 (8).

   Unstable, dissonant intervals give a tune (melody) note-to-note impetus. As previously mentioned, unstable intervals make it possible to create a tune that sounds like it has a "sense of purpose" or "story." A road trip.

As a musical scale, the chromatic scale fails miserably. It has 12 semitones—all highly unbalanced intervals. Way, way too many to function as a musical scale. To be sure, the chromatic scale also contains all the simple-frequency-ratio intervals. But your brain can't resolve them amid the din and cacophony of 12 dissonant semitones.

The Church modes don't succeed because:

- All of them except the Lydian wimp out at scale degree 7, the all-important leading tone. Instead of a semitone pointing strongly at 1 (8), they have a much-less-dissonant *whole tone.* Not enough tension and propulsion to establish 1 (8) as the note-of-notes, the alpha dog, the head honcho, the top banana, the big cheese, the great enchilada, the prime kahuna: Elvis, King of Scale Degrees.

If you're a musical mode on the make, and you can't even recognize that the cab driver showing you around Muscle Shoals is Elvis, how can you expect anybody to take you seriously enough to buy your music?

- Two of them, the Lydian and Locrian, form a tritone interval with the tonic at scale degree 4. There's no counter-balancing middle tone in these scales.

More on Church modes and harmony towards the end of Chapter 6.

5.3
Keys, Major and Minor

5.3.1
THE TWO SURVIVING MODES

Of the seven Church modes, only two are commonly used today, the two now called the *major mode* and the *minor mode*.

Recall that if you start your scale with the note C, then you get the *major scale*. The interval order of the major scale is:

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

Recall also that if you start your scale with the note A, then you get the *natural minor scale*. The interval order of the minor scale is:

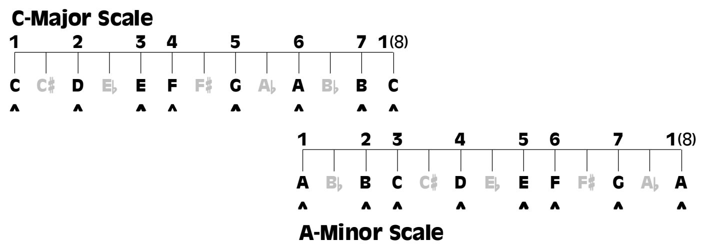
● tone ● semitone ● tone ● tone ● semitone ● tone ● tone ●

The seemingly trivial difference in the order of the five tones and two semitones makes a profound emotional difference when you hear the resulting music.

Both the C major scale and the A minor scale use *exactly the same set of notes*, but the minor scale starts at scale degree 6 of the major scale, and the major scale starts at scale degree 3 of the minor scale.

Figure 32 clarifies the matter, showing how these two scales relate to each other when you overlap their interval patterns:

FIGURE 32 How the C-Major and A-Minor Scales Relate to Each Other (7 Intervals, 8 Notes)



5.3.2
KEYS AND SCALES

Sometimes you find yourself playing or singing a tune that, for one reason or another, is "too high" or "too low." So what do you do? Change keys, of course.

But what does "change keys" mean?

First, the word "key" in the following discussion has nothing to do with the 88 black and white mechanical devices on a piano called "piano keys." So, from now on, to avoid confusion, the term "note" or "notes" will refer to the tones associated with the 88 black and white mechanical devices on the piano.

The term *key* refers to a given tonic note (*key note*) and the rest of the notes of its associated major or minor scale. (As you'll see in a bit, "key" encompasses the tonic note, the related scale, and the related chords.)

For example, if you're playing or singing in the *key* of C major, the *tonic note* is C, and the *scale* you use is the C major scale (corresponding to the white notes on the piano beginning and ending with C).

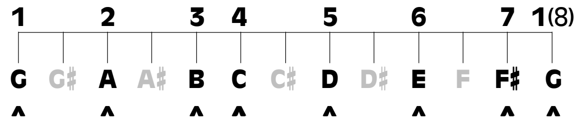
Suppose you want to "change keys." Maybe you want to switch to the key of G major. To do this, you have to do two things:

1. Use the note G as the tonic note of the scale, and
2. *Preserve the same order of intervals* as when you were playing in the key of C major, namely:

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

So, to play in the *key* of G major, here's the *scale* you need to use (Figure 33):

FIGURE 33 G Major Scale



Notice what happens at scale degree 7. Instead of F (a note in the key of C major), you have to use F♯ when you're in the key of G major. If you don't, you will violate the major scale interval order:

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

That's because, in the key of C major, the note F is in a completely different location in the scale—it's at scale degree 4, not 7.

On the piano, to play in the key of G major, you start the scale on the note G and continue through all the white notes *except* F. Instead of F, you play the black note, F♯.

G major and C major are both called *major* keys and you use *major scales* to play in these keys. The term *mode* is still used to refer collectively to keys and scales of the same type.

- Major keys and scales are referred to as keys and scales of the *major mode.*
- Minor keys and scales are referred to as keys and scales of the *minor mode*.

5.3.3 MUSIC'S "THEORY OF RELATIVITY" (NOT TO BE CONFUSED WITH CULTURAL RELATIVISM)

As you saw in Figure 32, the key of C major and the key of A minor use the same set of notes. All the white notes on the piano. No sharps or flats. To play a scale in the key of C major on the piano, you start on the note C and play the white notes only, up to the next C. To play a scale in the key of A minor, you start on the note A and play the white notes only, up to the next A.

Every major key, such as the key of C major, has a "related" minor key, such as the of A minor. Both keys always use *exactly the same set of notes*.

The key of A minor is called the *relative minor* of the key of C major. By the same token, the key of C major is called the *relative major* of the key of A minor.

Both keys use the same notes, but in a different order:

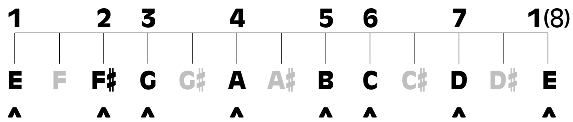
Key of C major: C D E F G A B C
Key of A minor: A B C D E F G A

Now consider the key of G major and its relative minor. Since the relative minor scale always starts at scale degree 6 of the major scale, it's clear from Figure 33 above that the relative minor of G major must be E minor.

And, since a major key and its relative minor always use exactly same set of notes, it would stand to reason that the F♯ note that appears in the key of G major must also appear in its relative minor key, which is E minor.

And sure enough, here's the stunning evidence, the E minor scale (Figure 34):

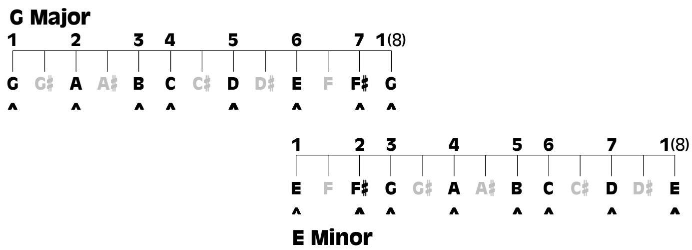
FIGURE 34 E Minor Scale



There's the F♯ note, exactly as predicted by modern science. It's uncanny. Like predicting the return of Halley's Comet, except of greater practical value for musicians.

Here's how the two keys relate to each other (Figure 35):

FIGURE 35 How G Major and E Minor Relate to Each Other



It's important to note here that F♯ in the above pair of scales is *not* a chromatic note, even though it has the "sharp" sign (♯) after it.

A *chromatic note* is a note that does not belong to the prevailing diatonic scale. Since a given diatonic scale has seven notes, there must be five notes that are chromatic with respect to that scale. In the above case, the five chromatic notes are: G♯, A♯, C♯, D♯, and F. They are the notes *in between* G, A, B, C, D, E, and F♯.

The same applies in harmony. In Chapter 6, you'll learn about chromatic *chords*. These are chords that do not belong to the prevailing harmonic scale.

SAM GOLDWYN'S THEORY OF RELATIVITY, AND MORE

Sam Goldwyn reputedly told Albert Einstein, "Professor, you have your theory of relativity and I have mine: never hire 'em."

Goldwyn, born Samuel Gelbfisz in Poland in 1882, emigrated to America and changed his name to Sam Goldfish and then to Sam Goldwyn. Good thing, or MGM would have been Metro-Goldfish-Mayer.

Goldwyn became almost as famous for his oxymoronic English as for his studio's films. Here are a few of Goldwyn's lessons on show business and life.

Classics

- A hospital is no place to be sick.
- A verbal contract isn't worth the paper it's written on.
- Anyone who goes to a psychiatrist ought to have his head examined.
- Gentlemen, include me out.
- I'll give you a definite maybe.
- Pictures are for entertainment, messages should be delivered by Western Union.

On music

- Please write music like Wagner, only louder.
- This music won't do. There's not enough sarcasm in it.

On movie-making and movie stars

- Give me a couple of years, and I'll make that actress an overnight success.
- We're overpaying him, but he's worth it.
- A wide screen just makes a bad film twice as bad.
- Don't pay any attention to the critics—don't even ignore them.
- Go see it and see for yourself why you shouldn't go see it.
- If people don't want to go to the picture, nobody can stop them.

- Our comedies are not to be laughed at.
- Spare no expense to save money on this one.
- Where they got lesbians, we'll use Albanians.

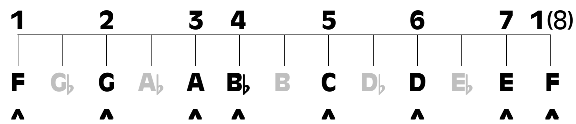
One final example. Suppose you want to switch to the key of F major. Now you need to make F serve as the tonic note. And you have to preserve the major mode order of intervals:

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

To do this, you have to *flatten* scale degree 4. Now you have B♭ instead of B, which preserves the major mode order of intervals.

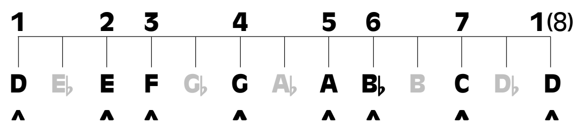
And here's the scale you get (Figure 36):

FIGURE 36 F Major Scale



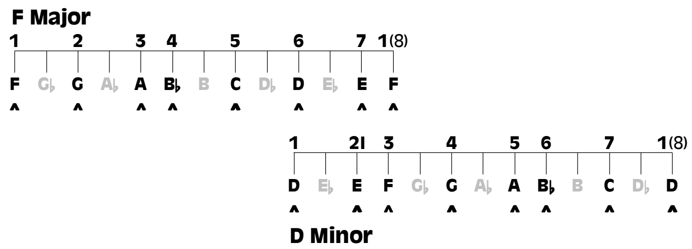
The relative minor of F, as noted earlier, starts at scale degree 6 of the major. So, as unassailable logic would have it, the relative minor of the key of F major has to be D minor. Not only that, it must also contain the note B♭ (Figure 37):

FIGURE 37 D Minor Scale



Here's how the two keys relate to each other (Figure 38):

FIGURE 38 How F Major and D Minor Relate to Each Other



You can start any major scale on any of the 12 different notes of the chromatic scale (the 13th note of the chromatic scale repeats the first note to complete the octave).

That means you can play in 12 different major keys.

The only rule is, whichever note you start on, you have to maintain the *major scale interval order*, which is (yet again):

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

even if that means you sometimes have to use a whole bunch of sharp or flat notes. Which is the case for some keys.

And, not surprisingly, all of this applies equally to the minor keys. You can start *any* minor scale on *any* of the 12 different notes of the chromatic scale.

That means you can play in 12 different minor keys.

Again, the only rule is, whichever note you start on, you then have to maintain the *minor scale interval order*, which is (yet again):

● tone ● semitone ● tone ● tone ● semitone ● tone ● tone ●

even if that means you sometimes have to use a whole bunch of sharp and flat notes. Which is the case for some keys.

5.3.4 ALL 12 MAJOR SCALES IN ONE CONVENIENT TABLE

Table 24 below shows all the notes and scale degrees for all 12 keys of the major mode. (The shaded bars are only a visual aid; they have no musical significance.)

- The row above the first shaded row names the scale degrees: 1, 2, 3, 4, 5, 6, 7, and 1 (8).
- The first shaded row is the scale of the key of C major.
- The next, slightly darker shaded row is the scale of the key of C sharp major.
- The next row is the scale and key of D major.

And so on.

TABLE 24 Major Scales, All 12 Keys

Tone		Tone		Semi-tone		Tone		Tone		Tone		Semi-tone	

1	2	3	4	5	6	7	1(8)
C	D	E	F	G	A	B	C
C♯	D♯	E♯	F♯	G♯	A♯	B♯	C♯
D	E	F♯	G	A	B	C♯	D
E♭	F	G	A♭	B♭	C	D	E♭
E	F♯	G♯	A	B	C♯	D♯	E
F	G	A	B♭	C	D	E	F
F♯	G♯	A♯	B	C♯	D♯	E♯	F♯
G	A	B	C	D	E	F♯	G
A♭	B♭	C	D♭	E♭	F	G	A♭
A	B	C♯	D	E	F♯	G♯	A
B♭	C	D	E♭	F	G	A	B♭
B	C♯	D♯	E	F♯	G♯	A♯	B

About that E♯ and that B♯ in the second row of the above table ... everybody knows there are no such notes as E♯ and B♯—those notes are actually F and C, respectively. The only reason they're called "E♯" and "B♯" in Table 24 is to ensure that all the notes of the C♯ scale have different letter-names. So you don't get confused.

Whenever you see two identical notes, intervals, scales, or keys with different names (or "spellings")—and it happens quite a bit in music—the two are called *enharmonic equivalents*. So, for instance, the key of C♯ is the enharmonic equivalent of the key of D♭. And the note E♯ is the enharmonic equivalent of the note F. Two different names for exactly the same thing.

Sometimes you even see double ... double sharps or double flats (after downing eight shots of tequila). For example, F♯♯, which normally looks like this: F𝄪 , is the enharmonic equivalent of G. (See Table 26 below.)

(Tuning purists will note that enharmonic equivalency only applies in equal temperament tuning, and that in other tuning systems, C♯ and D♭ are actually slightly different pitches. Fine. But in popular music, equal temperament rules. So in this book, C♯ and D♭ are always exactly the same note.)

5.3.5
ALL 12 DESCENDING MELODIC MINOR SCALES IN ONE CONVENIENT TABLE

Table 25 below shows all the notes and scale degrees for all 12 scales of the natural minor mode. Notice the difference in the pattern of tones and semitones, compared with the major mode (Table 24). Again, the shaded bars are only a visual aid; they have no musical significance.

The scales in Table 25 are the relative minors of those in Table 24.

And, of course, it's equally correct to say the scales in Table 24 are the relative majors of the scales in Table 25.

Another name for the natural minor scale is the *melodic minor*. And, to make matters even less straightforward (if that's possible), the melodic minor comes in two, count 'em, two flavors: descending and ascending. More about this in a minute.

First, the descending version (Table 25). NOTE: Read the scales in this table from right to left.

TABLE 25 Descending Melodic Minor Scales (Right to Left), All 12 Keys

● Tone ● Semi-tone ● Tone ● Tone ● Semi-tone ● Tone ● Tone ●

1	2	3	4	5	6	7	1(8)
A	B	C	D	E	F	G	A
A♯	B♯	C♯	D♯	E♯	F♯	G♯	A♯
B	C♯	D	E	F♯	G	A	B
C	D	E♭	F	G	A♭	B♭	C
C♯	D♯	E	F♯	G♯	A	B	C♯
D	E	F	G	A	B♭	C	D
D♯	E♯	F♯	G♯	A♯	B	C♯	D♯
E	F♯	G	A	B	C	D	E
F	G	A♭	B♭	C	D♭	E♭	F
F♯	G♯	A	B	C♯	D	E	F♯
G	A	B♭	C	D	E♭	F	G
G♯	A♯	B	C♯	D♯	E	F♯	G♯

So ... what's with this "descending melodic minor" business?

The natural minor mode sounds pretty natural when you're going *down* the scale. However, when you're going *up* the scale, you don't feel "propelled" up to 1 (8). Why? Because the interval between scale degrees 7 and 1 (8) is a *whole tone*, instead of a semitone.

Going up the scale, there's no strong *leading tone*.

As noted earlier with the major scale, a semitone interval formed by scale degrees 7 and 1 (8) has considerable inherent tension, because a semitone is derived from a more complex frequency ratio (16:15), compared with a whole tone (9:8). That's why the note occupying scale degree 7, if it forms a semitone interval with 1 (8), is called the leading tone.

NOTE: The leading tone is vitally important in understanding how chord progressions work! Chapter 6 discusses leading tones in detail.

Here's one tiny little tip about the descending melodic minor scales in Table 25 above. Have a look at the D minor scale. It's identical to the Dorian mode except that scale degree 6 is flatted. So, any time you want to play the Dorian mode in any key, all you need to do is play the descending melodic minor for that key, except sharpen scale degree 6 by a semitone.

5.3.6 ALL 12 ASCENDING MELODIC MINOR SCALES IN ONE CONVENIENT TABLE

To solve the problem about the lack of a leading tone in the minor keys, somebody decided a long time ago to keep the natural minor scale (the Aeolian mode) exactly as it is for purposes of descending (Table 25 above), but *sharpen* scale degrees 6 and 7 for purposes of ascending.

Together, the two scales became known as the *melodic minor scale*.

Here are the 12 *ascending* melodic minor scales (Table 26).

TABLE 26 Ascending Melodic Minor Scales (Left to Right), All 12 Keys

(NOTE: × = ♯♯)

● Tone ●	Semi-tone ●	Tone ●	Tone ●	Tone ●	Tone ●	Semi-tone ●	
1	2	3	4	5	6	7	1(8)
A	B	C	D	E	F♯	G♯	A
A♯	B♯	C♯	D♯	E♯	F×	G×	A♯
B	C♯	D	E	F♯	G♯	A♯	B
C	D	E♭	F	G	A	B	C
C♯	D♯	E	F♯	G♯	A♯	B♯	C♯
D	E	F	G	A	B	C♯	D
D♯	E♯	F♯	G♯	A♯	B♯	C×	D♯
E	F♯	G	A	B	C♯	D♯	E
F	G	A♭	B♭	C	D	E	F
F♯	G♯	A	B	C♯	D♯	E♯	F♯
G	A	B♭	C	D	E	F♯	G
G♯	A♯	B	C♯	D♯	E♯	F×	G♯

Notice something familiar about the upper half of the ascending melodic minor scale, from 5 to 1 (8)? It's identical to the upper half of the good ol' do-re-mi major scale.

And that means, if you want to play an ascending minor scale in any key, all you need to do is make like you're playing the major scale for that key, but lower scale degree 3 by a semitone.

See, for example, the C minor scale in Table 26. It's identical to the C major scale, except that scale degree 3 is flat (E♭) instead of natural (E).

While you're at it, have a look at the D minor scale in Table 26. Again, it's identical to the Dorian mode except for one scale degree. This time, to get the Dorian mode, just lower scale degree 7 of the ascending melodic minor scale by one semitone.

Aah, but it ain't over yet. No no no no no.

MORE SAM GOLDWYN (TO HELP ALLEVIATE THE TEDIUM OF THESE SECTIONS ON MINOR SCALES)

On television

- Color television! Bah, I won't believe it until I see it in black and white.
- Television has raised writing to a new low.
- Why should people go out and pay money to see bad films when they can stay at home and see bad television for nothing?

On being right

- I don't want any yes-men around me. I want everybody to tell me the truth even if it costs them their job.
- I'm willing to admit that I may not always be right, but I am never wrong.
- If you don't disagree with me, how will I know I'm right?

On death, real and imagined

- The scene is dull. Tell him to put more life into his dying.
- The reason so many people turned up at his funeral is that they wanted to make sure he was dead.
- I don't think anyone should write their autobiography until after they're dead.
- If I could drop dead right now, I'd be the happiest man alive.

Deep, high philosophy to live by

- I never put on a pair of shoes until I've worn them at least five years.
- I never liked you, and I always will.
- A bachelor's life is no life for a single man.
- If you fall and break your legs, don't come running to me.
- You've got to take the bitter with the sour.

5.3.7 ALL 12 HARMONIC MINOR SCALES IN ONE CONVENIENT TABLE

There's yet *another* "official" version of the minor scale.

This final annoying version of the minor scale is the same as the *descending* natural minor up to scale degree 6, but sharpens scale degree 7. The idea is to give the natural minor scale a leading tone. Doing this, however, creates an awkward gap of *three semitones* (an interval of an augmented second) between scale degrees 6 and 7.

Some songwriters and composers think this version of the minor scale, called the *harmonic minor scale*, is just hunky dory. Not only do you have a nice leading tone, but you don't have to concern yourself with separate ascending and descending versions of the minor scale. Still, there's that ungainly three-semitone interval ...

TABLE 27 Harmonic Minor Scales, All 12 Keys

	Tone	Semi-tone	Tone	Tone	Semi-tone	Aug. 2nd	Semi-tone
1	2	3	4	5	6	7	1(8)
A	B	C	D	E	F	G♯	A
A♯	B♯	C♯	D♯	E♯	F♯	G×	A♯
B	C♯	D	E	F♯	G	A♯	B
C	D	E♭	F	G	A♭	B	C
C♯	D♯	E	F♯	G♯	A	B♯	C♯
D	E	F	G	A	B♭	C♯	D
D♯	E♯	F♯	G♯	A♯	B	C×	D♯
E	F♯	G	A	B	C	D♯	E
F	G	A♭	B♭	C	D♭	E	F
F♯	G♯	A	B	C♯	D	E♯	F♯
G	A	B♭	C	D	E♭	F♯	G
G♯	A♯	B	C♯	D♯	E	F×	G♯

How to remember the harmonic minor? It's the same as the Aeolian mode, also known as the descending melodic minor (white keys on the piano, starting and ending with A), except that you raise the seventh note by a semitone.

So, those are all the scale variants of the diatonic order still in use today. Four of them: one type of major scale and three types of minor scales. That's it. No more!

Well, okay. One more.

5.3.8 HOW DIGGER'S 10-NOTE "GRAND MINOR SCALE" SIMPLIFIES MATTERS

When you're writing a song or composing a piece of music in a minor key, it doesn't much matter which version of the three minor scales you use—natural minor, melodic minor, or harmonic minor. All of these minor scales differ *only* in the upper half of the scale. The lower half is identical in all of them.

Your brain hears the critical difference between the sound of the major mode and the sound of the minor mode, not in the upper half of the scale, but in the *lower half*.

Only one note makes all the difference, and that note is *scale degree 3*.

- In the major mode, the interval from the tonic note to scale degree 3 is a major third—a pitch span of four semitones.

- In the minor mode, whether ascending or descending, the interval is always a minor third—a pitch span of three semitones.

The "character" of the moody-sounding "minor" mode comes exclusively from *scale degree 3*, the minor third interval common to *all versions* of the minor scale.

So...go ahead and use any minor scale you please. All of them have that distinctive "minor" sound.

In fact, you can merge all the minor scales together, like this:

- For the lower half of the scale, just use the five notes that all three minor scales have in common. For example, in the key of A minor:

A B C D E

- For the upper half of the scale, use *all* of the tones and semitones, like this (key of A minor):

F F♯ G G♯ A

Slap the lower and upper halves together, and what do you get? An all-purpose handy-dandy *10-note minor scale*. It slices! it dices!

A B C D E F F♯ G G♯ A

This scale contains all of the notes of all three minor scale types. (Tables 25, 26, and 27). What's it called? Why, the ***Grand Minor Scale***, of course.

Go ahead, play it on your guitar or piano. Play it ascending, play it descending. You may think it sounds more "minor" than any of the other three minor scales.

You'll find the Grand Minor Scale most useful in the discussion of melody in Chapter 9.

We owe the 10-note Grand Minor Scale to Stephen "Digger" Souza. (No, not the guy who fronted the heavy metal bands Testament and Exodus.) Digger Souza is a musician from Massachusetts who, in his rush to get a ride home from a concert one time, crashed over some chairs and dug his face into the rug, picking up some burn marks and a nickname at the same time.

BLUE NOTES

Now that you know all about scales, pay another visit to the beginning of this chapter, the section on the blues scale, where the term *blue note* was introduced.

A blue note can be a **flat third**, **flat fifth**, or **flat seventh** scale degree of the diatonic major scale.

For example, the C *major* scale consists of these notes:

C	D	E	F	G	A	B	C
1	2	3	4	5	6	7	1(8)

The C *blues* scale consists of these notes:

C	E♭	F	G♭	G	B♭	C
1	♭3	4	♭5	5	♭7	1 (8)

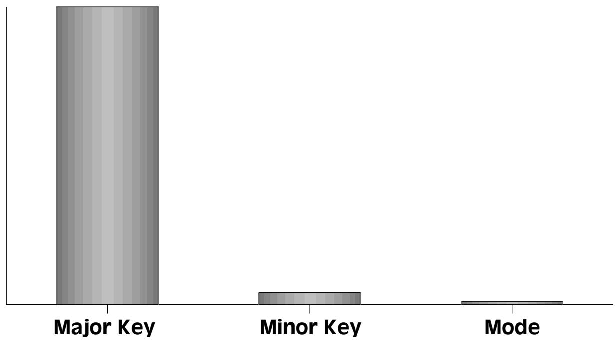
The blues scale has **all three** traditionally-recognized blue notes, commonly heard in blues and jazz, and to a lesser degree in rock, hip-hop, and British and Celtic folk.

The blues scale has only six notes and no leading tone. However, all those chromatic notes stick out and grab listener attention. (More on this in Chapter 9.)

5.3.9 RELATIVE NUMBERS OF POPULAR SONGS IN MAJOR KEYS, MINOR KEYS, AND MODES

So far, Chapter 5 has focussed on major keys, minor keys, and Church modes. In popular music, by far most songs are written in major keys, followed by minor keys, followed by modes. Figure 39 gives you a rough idea of the proportions.

FIGURE 39 Relative Numbers of Popular Songs in Major Keys, Minor Keys, and Church Modes



Suppose you're a performing songwriter, and you want to distinguish your songs from everyone else's. Most songwriters write pretty much all of their songs in major keys. So ... why not specialize in writing your songs in minor keys? Even some songs in Church modes?

Minor-key songs can be wickedly effective. Here are half a dozen classic examples:

- "London Calling" (The Clash)
- "Summertime" (words by Du Bose Heyward, music by George Gershwin)
- "I Heard It Through the Grapevine" (words and music by Norman Whitfield and Barrett Strong)
- "House of the Rising Sun" (traditional)
- "Ghost Riders in the Sky" (words and music by Stan Jones)
- "All Along the Watchtower" (words and music by Bob Dylan)

All of these songs are on the GSSL. A couple of them, "Grapevine" and "Watchtower," are discussed in detail in Chapter 6.

5.3.10
EMOTIONAL EFFECTS OF MODES

Research strongly supports the "happy" vs "sad" distinction most people (both adults and children) associate with major vs minor modes. Mode and tempo are two of the most important musical variables with respect to emotion-elicitation. Both could easily be exploited by songwriters to great effect, but usually aren't, because most songwriters have no idea how powerful they are. More on these variables in Chapters 7 and 9.

(Bob Dylan's "Who Killed Davey Moore?" and Vaughn Monroe's original recording of Stan Jones' "Riders In The Sky," aka "Ghost Riders In The Sky" are examples of songs that maximize the emotional power of fast tempo combined with the minor mode.)

It *may* be that the unsettled feeling people have when hearing a minor interval or chord arises from the fact that the intervals that make up minor chords and scales are derived from less simple frequency ratios than those for major chords and scales, which stand out prominently in the first overtones of the harmonic series (see Table 23) and enable easy identification of the origin of the sound as a single soundmaker. If you can't be sure the source is a single soundmaker, you find it unsettling. Fear of the unknown.

Whatever the reason for the sharp emotional distinction between major and minor, it's a fact of human nature, not a cultural construction. Table 28 spells it out in more detail.

TABLE 28 Emotional Effects of Modes

Mode Type or Characteristic	Associated Emotions
Major mode (major key)	Happiness, grace, serenity, solemnity
Minor mode (minor key)	Sadness, anger, dreaminess, tenseness, suffering
Major and minor modes alternating	Tenderness
Mode unclear due to tense, dissonant harmonies	Fear

5.4 Tuning, Temperament, and Transposing

5.4.1 "HOW COME I CAN'T TUNE THIS #@*&!% THING?"

If you write a piece of music in a single key, you'll likely have no problem with musical unity. The arrangement of intervals in the diatonic scale ensures a strong tonal centre. A nice, small assortment of six related notes (scale degrees 2 through 7) all point to the tonic note.

Moreover, assuming your song has words, you'll likely organize the words into verses and choruses, each sung to the same musical phrases. This reinforces musical unity.

But too much musical unity ain't necessarily a good thing. It can get boring.

To get some variety happening, you have the option of changing keys partway through the song. And, since every key has its own tonal centre, you preserve unity at the same time as you create variety.

Several hundred years ago, when musicians and musical theorists were experimenting with changing keys within a piece of music, a nasty problem kept bedevilling them. Whenever they tried to switch to a new key, their instruments sounded out of tune. *Hellish* out of tune.

The problem was the dang Pythagorean comma. As discussed in Chapter 4, if you tune an instrument using exact Pythagorean 3:2 frequency ratios, you end up with an octave that is slightly bigger than it ought to be. About a quarter of a tone too big.

For example, Middle C has a frequency of 261.6 Hz. So the frequency of the C above Middle C ought to be exactly double: 523.2 Hz.

But if you use exact Pythagorean fifths, you end up with C above Middle C having a frequency of 530.3 Hz. Noticeably too sharp.

If instead you tune in perfect 2:1 octaves, then the other notes derived from simple frequency ratios such as 3:2, 4:2, and so on, end up either too sharp or too flat.

What to do?

5.4.2 DON'T LOSE YOUR EQUAL TEMPERAMENT

Musicians and theorists tried all sorts of variations on the theme of *just intonation*, methods of tuning with simple whole-number frequency ratios. Such tuning systems—and there are many—enable the tuning of an instrument so that it's playable in one key, or perhaps even several keys. But if you try to play in keys the instrument isn't tuned for ... forget it. Doesn't work.

Eventually, one of the numerous tuning solutions attempted over the centuries emerged the clear winner. The solution was to:

1. Stick to an exact 2:1 octave, despite the Pythagorean comma.
2. Divide the octave into 12 *exactly equal* semitones.

This system is called *equal temperament* (from *temperare*, the Latin root meaning to mix or mingle).

To get the frequencies for each semitone:

- Start with the first note of the scale and multiply its frequency by the 12th root of two.

- Take that frequency and multiply it by the 12th root of two, which gives you the frequency for the next semitone up.

- Repeat until you get to the next octave.

The 12th root of 2 is the number 1.05946 (rounded off). So the ratio of any semitone to the semitone below is 1.05946:1.

Table 29 shows the frequencies of all the notes from Middle C to the octave above Middle C, with each successive frequency multiplied by the 12th root of two:

TABLE 29 Equal Temperament Frequencies for Tones from Middle C to C Above Middle C, and Associated Simple Frequency Ratios

Note	Equal Temperament Frequency (Hz)	Interval with Middle C	Simple Frequency Ratio (SFR)	Associated SFR Frequency (Hz)
Middle C	**261.6**	Unison	1:1	261.6
C♯	277.2	Minor 2nd	16:15	279.0
D	293.6	Major 2nd	9:8	294.3
E♭	311.1	Minor 3rd	6:5	313.9
E	329.6	Major 3rd	5:4	327.0
F	349.2	Perfect 4th	4:3	348.8
F♯	370.0	Tritone	45:32	367.9
G	392.0	Perfect 5th	3:2	392.4
A♭	415.3	Minor 6th	8:5	418.6
A	440.0	Major 6th	5:3	436.0
B♭	466.1	Minor 7th	16:9	465.1
B	493.8	Major 7th	15:8	490.5
C	**523.2**	Octave	2:1	523.2

So, when you're playing in any given key, only the two octave notes are in an *exact* 2:1 simple frequency relationship. Every other note is *slightly out of tune*, compared with the simple frequency ratio expected from the harmonic series.

For example, in Table 29 above:

- The frequency for the note G would be 392.4 Hz if it were tuned in an *exact* 3:2 ratio with Middle C. But the equal temperament frequency of G is 392.0 Hz (slightly flatter).

- The frequency for the note E would be 327.0 Hz if it were tuned in an *exact* 5:4 ratio with Middle C. But the equal temperament frequency of E is 329.6 Hz (slightly sharper).

- The frequency for the note C♯ would be 279.0 Hz if it were tuned in an *exact* 16:15 ratio with Middle C. But the equal temperament frequency of C♯ is 277.2 Hz (slightly flatter).

Similarly, in equal-temperament tuning, all of the other notes are either slightly flat or slightly sharp, compared with their simple-frequency-ratio counterparts.

The equal temperament solution works. Your brain accepts the small "pitch errors"—slight deviations from simple ratios—when they're equally distributed over all 12 semitones. Since every semitone interval is exactly equal, you can construct diatonic scales using any of the 12 semitones as the tonic note, and the octave notes will always have a frequency ratio of *exactly* 2:1. Equal temperament makes something called *modulation* possible (coming up shortly).

Consequently, equal temperament has been the norm for about three centuries in Western music.

Equal temperament works only because the pitch errors are small—so small that your forgiving brain processes them as though they were simple frequency ratios.

When you try to tune a guitar or other stringed instrument using harmonics from string to string, it doesn't quite work out because you're not using equal temperament. That's why the best tuning device is a digital tuner, with equally-tempered frequencies built into the electronics that are accurate to many decimal places.

GET THAT MAN A DIGITAL TUNER

Some people think equal temperament is a Bad Thing because every single note between the octave notes in any key is slightly dissonant. Others think equal temperament is a Good Thing for two main reasons:

1. It solves the dang tuning problem, already; and

2. Every single note between the octave notes in any key is slightly dissonant—and therefore music played on equally-tempered instruments sounds more colourful and interesting than it would if all the notes were exactly in tune.

Obviously, J. S. Bach agreed with the latter view. Nobody had a keener ear. Bach would surely have been able to easily hear the

out-of-tuneness of equal temperament. Yet he famously celebrated equal temperament by composing *The Well-tempered Clavier*, a two-book masterwork of 24 preludes, one in each major and minor key, and 24 fugues, one in each major and minor key.

One other tuning-related problem took even longer to solve: what to do about a *reference frequency*. One note and its associated frequency needs to serve as a standard to derive the frequencies for all the other notes, using equal temperament.

After centuries of hair-pulling and fang-gnashing, everybody agreed in 1939 that the note A above Middle C would always be tuned to exactly 440 Hz, and would therefore serve as the reference pitch for setting all the other pitches. (Then World War II started.)

This tuning pitch is called *Concert A* or *A-440*.

A FREE EMERGENCY DIGITAL TUNER

When you're lost in Juarez in the rain and you don't have a digital tuner with you but you *must* tune your guitar, what can you do?

Why, just reach in your pocket and whip out your trusty cell phone. Or wander around until you find a pay phone. Get a dial tone, and you've got your reference note. The dial tone is F. Specifically, it's the F on the first fret of the low E-string of your guitar, the F that's one and a half octaves below Middle C.

5.4.3 "IT'S TOO LOW (OR HIGH) FOR MY VOICE": TRANSPOSITION

It happens to everybody. You swagger into the Wrong Ranch Saloon and start singin' a tune and everything's goin' along fine until you get to the lowest notes (or the highest notes), and you can't hit them.

People turn and laugh at you. Especially the dusty cowpoke, the one who outdrew Billy Joe. You laugh along with them, vainly attempting to hide your humiliation. Tears stream down your face. It's no use. They know, they know. Yes,

they know you started singing in a key that did not match your vocal register for that particular song.

But it's too late. Marshal Puma senses trouble brewing and allows as how you might live to see tomorrow if you get outta Dodge tonight. So you stumble out of the saloon into the dusty main street. Sadie and Ellie Sue offer you a fresh horse and away you go to join Ex-Marshal McDillon in exile.

If only you had thought to start over, *in a different key.*

Transposition refers to moving a whole group of notes (such as the entire melody of a song) up or down in pitch.

- If you play guitar, you can do this easily without even changing chord fingering. All you do is move your capo up or down the fretboard.

- On the piano, it's not so easy. You have to change the way you finger the melody and chords for every dang key you play in.

You can use tables 24, 25, 26, and 27 for transposing. They show you, row by row, the scales for each key. If you're singing in the key of C major and you want to know what notes you'd be singing if the tune were transposed to E major, just go to Table 24 and compare the C Major row with the E major row. For instance, if you want to transpose the notes C, D and E in the key of C major to the key of E major, the equivalent notes would be E, F♯, and G♯.

It's that simple.

One important thing to keep in mind at all times with respect to key changes and transposing:

There's no such thing as a "high key" or a "low key."

A key is just an interval order with respect to a key note or tonic note. The key of E major is neither "higher" nor "lower" than the key or C major or any other key.

The way a songwriter or composer has arranged the intervals of a particular melody determines which key you will be able to sing it in, without the tune being too high or too low for your particular voice.

You can sing some songs easily in the key of C major, but not in the key of G major. You can sing other songs easily in the key of G major, but not in C major. The determining factor is *not the key*. It's how the melody itself is structured. The key of C major is not inherently "higher" or "lower" than the key of G major.

That goes for all the keys, major and minor.

5.4.4 HOW TRANSPOSING INSTRUMENTS WORK

If you happen to read music notation, the idea of a "transposing instrument" will make more sense than if you don't happen to read music notation.

Most musicians don't read music notation, which is why this book has no music notation. Still, even if you don't read music, you might find a brief description of the meaning of "transposing instrument" mildly entertaining. George Martin, the classically-trained producer of The Beatles, once tried to explain the workings of transposing instruments to John Lennon, who did not read a note of music. Lennon thought it was all pretty daft.

A true transposing instrument (as opposed to an octave transposing instrument—more on the distinction in a minute) is a *wind instrument* (aerophone) for which the musical notes on the page *differ* from the notes the instrument makes. You see a note on the page, you finger the instrument to play that note, and a *different* note comes out of your instrument.

What's going on?

Any given musical instrument is constructed so that it can handle only a certain range of pitches. The guitar, for instance, only has a certain number of frets, limiting the upper and lower range of the instrument.

This applies to wind instruments, like any other. So it's common to have "families" of wind instruments—families of clarinets, flutes, and saxophones, for instance—of varying sizes. The smaller-sized instruments handle higher pitches, the larger ones, lower pitches.

For instance, each of the four common sizes in the saxophone family—soprano, alto, tenor, and baritone—is good for a certain range of pitches, from a high-pitched range (soprano sax) to a low-pitched range (baritone sax).

All saxophones use the *same fingering* for a particular written note. So, if you learn to play, say, alto sax, and you decide to switch to another sax in the same family, you don't have to learn a whole different way of fingering.

Problem is, because each instrument is built for a different pitch range, when you finger the alto sax to play, say, the written note C, the note you actually hear coming out of your horn is *E♭, 9 semitones below C.* On the tenor sax, when you finger the instrument to play C, the note that comes out is *B♭, more than an octave below the C written on the page.*

Therefore, composers and orchestrators must notate the music so that it accounts for the difference between the notes that come out of the transposing instrument and the notes on the page.

Suppose the composer wants the sound coming out of the alto saxophone to be in the key of C. The composer needs to notate the music *nine semitones higher* (an interval of a major sixth) on the page—in the key of A. The alto sax player sees an

A on the page, fingers the horn to play A, and out comes the *sound* of the note C, nine semitones lower—as the composer intended.

So, written music for the alto sax must be transposed up by an interval of a major sixth (all notes!), in order to sound the way the composer intended.

This all seems pretty odd, but it makes a lot of sense for wind players who read music. They don't have to cope with learning new fingerings for each instrument in a family. Instead, it's up to the composer or orchestrator to ensure that the music is transposed on the page properly for the intended instrument and the intended sound.

Some instruments are "octave transposing" instruments. The guitar, for instance. Notated music for the guitar is written an octave higher than it sounds when you play the music. When you play the note Middle C from the page, you still hear the note C, but it's the C an octave below Middle C.

5.5 Modulation and Tonality

5.5.1 THE KEYS, THEY ARE A-CHANGIN' (GOOD THING, TOO)

Why in blazes did so many people struggle for so long to come up with a musical system of 12 major keys, 12 minor keys, and equal temperament?

To open and explore new frontiers of brain-friendly musical variety without sacrificing musical unity.

As will become clearer in later chapters, with too little variety, listeners get bored. With too little unity, they get confused. The equally-tempered 24-key system enables composers and songwriters to move around melodically and harmonically from key to key, while maintaining a cohesive musical narrative.

Changing keys within a piece of music is called *modulation.*

Modulation enables a songwriter to slip through tonal doorways into the *parallel universes* of other keys. It's one of the most powerful ways to create interesting, compelling music. Most songwriters don't use modulation simply because they don't know how. It's not difficult to learn, and you certainly don't need to know anything about music notation to make full use of modulation.

Each of the 12 major and minor keys has a unique set of notes. Think of each key as its own musical universe. If you write a song that stays in one key throughout the

song, you effectively stay within one musical universe—even though there's nothing stopping you from travelling to any of 23 other musical universes using modulation.

For example, you could start off in the key of C Major. You compose a tune using the notes C, D, E, F, G, A, and B. Then, you could switch to the key of E♭ major, and continue the tune using the notes E♭, F, G, A♭, B♭, C, and D (see Table 24 above). When you do this (modulate), the tune suddenly takes on new life, because the key of E♭ introduces a *parallel universe* of notes.

- It's a *parallel* musical universe because, as you can see in Table 24, the E♭ major scale uses the same interval order as the C major scale:

  ● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

- But it's a *different* musical universe, because every note of the E♭ major scale is pitched three semitones away from its counterpart in the C major scale.

It's as though you're playing your guitar without a capo and singin' a tune in the key of C major, and then, part way through the tune, exactly when you want it to happen, a capo magically clamps down on the third fret (while you continue playing chords in the key of C), changing the key to E♭ major.

PARALLEL UNIVERSES ON A SOMEWHAT GRANDER SCALE

Speaking of parallel universes, you might be living in one universe and copies of you in other universes.

Physicists have hypothesized that the existence of parallel universes would explain a number of observed phenomena in quantum mechanics and cosmology that otherwise don't make horse sense.

One of the best known and respected hypotheses is that of the American physicist Hugh Everett. According to his "many-worlds" or "multiverse" interpretation of quantum mechanics, there are many copies of you, each existing in a separate parallel universe. However, a phenomenon known as "quantum decoherence" prevents you from communicating with your other selves. (Dang!)

Mathematically, Everett's theory respects scientific determinism (important in formulating theories in physics), and also does not

require the acceptance of hidden variables, a weakness of other interpretations of observed phenomena in quantum mechanics.

Some evidence indicating the existence of parallel universes:

- Physicists have conducted many successful demonstrations of teleportation, from data-encoded laser beams to calcium and beryllium atoms. (Alas, they have not yet succeeded in teleporting Captain Kirk ...)

- A number of investigators have successfully demonstrated quantum computing on a small scale. A quantum computer could theoretically handle huge numbers of complex calculations millions of times faster than conventional computers because the computations would take place simultaneously in parallel universes.

- Solitary particles passing through a "double slit" apparatus at random intervals of time create interference pattens that could only be made by *groups* of particles. Copies of particles from parallel universes passing through the double slits at the same time as the solitary particles would explain the collective characteristics of the interference patterns.

David Deutsch and Michio Kaku (see the References section), among others, have written good, readable books on parallel universes, in case you're interested in what your other selves might be up to.

5.5.2 A BRIEF, STAR SPANGLED MODULATION

Modulation is both melodic and harmonic in nature. What follows is an example of a brief modulation. Chapter 6 goes into more depth about the various types of modulation and the kinds of chord progressions you can use to modulate.

How exactly do you modulate? One way is to exploit the brain's recognition of the *semitone move* from 7 to 1 (8), from the leading tone to the key note of the scale. For example, stick a semitone move in an unexpected place and use it to *signal* a modulation—a change to a new key with a different tonal centre.

This is what happens near the beginning of "The Star Spangled Banner," on the notes to the words, "early light." The tune *does not* proceed along the scale like this (the numbers represent scale degrees):

3 4 5
ear - ly light

Instead, the tune has a *sharpened* scale degree 4, creating a semitone between 4 and 5:

3 ♯4 5
ear - ly light

Suppose you're singing "The Star Spangled Banner" in the key of C major. If the tune had been composed without using any chromatic notes (notes outside the notes of the C major scale), then you would sing these notes:

E F G
ear - ly light

and the tune would sound completely different from the tune you know. Instead, songwriter John Stafford Smith did this:

E F♯ G
ear - ly light

That's the sequence of notes you actually sing.

A sharp (♯) or flat (♭) symbol that designates a chromatic note that a composer adds into a tune is called an *accidental*. So, in the above example, the "♯" sign in "F♯" is an accidental.

PURPOSEFUL ACCIDENTALS

You could run across any of **five kinds of accidentals:**

1. Sharp (♯): raises a note by one semitone;
2. Flat (♭): lowers a note by one semitone;
3. Natural (♮) restores a raised or lowered note back to its "natural" state;
4. Double sharp (♯♯, normally symbolized like this: 𝄪) raises a note by two semitones;
5. Double flat (♭♭) lowers a note by two semitones.

Notice that move from F♯ to G. A chromatic note causes a *semitone move*. That's the important thing here. Did songwriter Smith make this move to signal a change to another key (a modulation)? If so, which key is the music moving to?

First, have a look at the interval order of the major scale (for the umpteenth time):

● tone ● tone ● semitone ● tone ● tone ● tone ● semitone ●

There are two semitones in this interval order. One is between scale degrees 3 and 4. The other is between scale degrees 7 and 1 (8).

Next, have a look at Table 30 below (an excerpt of Table 24). It shows that only two keys have the specific interval, F♯ to G. One occurrence, in the key of D major, corresponds to the move from 3 to 4. The other, in the key of G major, from 7 to 1 (8).

TABLE 30 Major Keys with Occurrences of F♯-to-G Interval

●	Tone	●	Tone	●	Semi-tone	●	Tone	●	Tone	●	Tone	●	Semi-tone	●
1		2		3		4		5		6		7		1(8)
D		E		F♯		G		A		B		C♯		D
G		A		B		C		D		E		F♯		G

So, if that F♯ is signalling a modulation, it could be to one of two keys. It could be to the key of D via 3 to 4. Or it could be to the key of G, via 7 to 1 (8).

Which is it?

One way to signal a new tonal centre is to hold a note a bit longer after making a move from VII to I (8). In this example, the word "light" gets held for a couple of beats.

So, it would appear, the modulation is to the key of G, because the note G is held for a couple of beats. This is what songwriter Smith has done.

But the modulation does not last long. Hardly long enough to consider it a bona fide modulation. Within a couple of notes, the tune goes back into the key of C.

The modulation is just long enough to accomplish the songwriter's aim: to infuse the tune with some variety without sacrificing unity.

A limited modulation of this nature, a modulation that does not completely establish another tonal centre, is usually called a *tonicization.* In this example, the F♯ "tonicized" G—made G the tonic note—although only briefly. No clear-cut boundary exists between tonicization and full-blown modulation. Think of tonicization as a mild modulation. Modulation lite. It adds color, variety, interest.

In an inspired stroke of modulatory repetition, the songwriter duplicates this tonicization later in the tune, on the words "was still there" (I. e., in the phrase, "our flag was still there"). This reinforces unity (repetition) plus variety (modulation).

5.5.3 SIGNALLING A SHIFT IN TONAL CENTRE

Another way to strongly signal a shift in tonal centre is to exploit the other semitone interval in the major diatonic scale, the interval from 3 to 4.

Suppose, for example, your tune starts by running up the scale from 1 to 3 and back a few times. Then it moves from 7 to 1 (8) to establish 1 as the tonal centre.

Then suppose the tune repeats a move from 3 to 4 several times, then continues up the scale to 5, then 6, touching on ♭7, then back down to 6 and up to ♭7 and back once or twice. Then back down to 5, then 4.

For example, starting in the key of C major, the tune would run up and down the scale from C to D to E and back a few times. And also from B to C to establish the initial tonal centre.

Then it would go from E to F several times. Then it would proceed up to G, A, and touch on B♭, back and forth once or twice. Then back down to G, then F.

It's that B♭ that sends a signal to your listener's brain that something has changed. The note B♭ is not a note in the C major scale. It's a foreign, chromatic note. This heightens musical interest.

By introducing that B♭ note, you have signalled that the tonal centre has shifted.

- The notes E and F have become the new scale degrees 7 and 1 (8).
- The notes G, A, and B♭ have become the new scale degrees 2, 3, and 4.
- That means you have modulated from the key of C major to the key of F major.

Look it up. Table 24 above. Try it out to get the drift of it.

The thing is, you have control over these musical variables. If you want to, you can pick a couple of keys, decide you're going to write a tune that modulates from one key to the other and back again, then write a tune and a set of chord changes that does exactly that. If you know what you're doing, the tune is likely to be a lot more musically interesting than it would have been had you stayed in one key throughout.

5.5.4
"THE CENTRE CANNOT HOLD" (OR CAN IT?)

Turning and turning in the widening gyre
The falcon cannot hear the falconer;
Things fall apart; the centre cannot hold;
Mere anarchy is loosed upon the world,
The blood-dimmed tide is loosed, and everywhere
The ceremony of innocence is drowned
— W. B. YEATS ("The Second Coming")

Yikes! Mr. Yeats, it couldn't be that bad, could it?

Well, actually, it could. Modulation means changing the *tonal centre* within a song or other composition. And when you change the tonal centre, mere anarchy just might be loosed upon the world if you aren't careful.

Some songwriters modulate skilfully. Most are afraid to even try. Some modulate clumsily, throwing in melodic twists and chord changes without the slightest idea of what they're doing musically. This has nothing to do with ability or inability to read or write music.

If you move the melody at random to some chromatic note or other, or throw in an out-of-context chord, thinking you're introducing musical variety, chances are, you'll screw things up. You will muddy the waters. Mere anarchy will be loosed upon the world. The blood-dimmed tide will be loosed. And, yes, everywhere the ceremony of innocence will be done drowned. And maybe your horse, too.

When you're experimenting with new tunes and chord changes, you need to have an awareness in the back of your mind of the musical implications of introducing chromatic notes into a tune. Particularly when you also accompany chromatic notes with chromatic chords (chords comprised of notes that are outside the key you're playing in). You might actually be signalling a modulation. Whether you know it or not. Whether you mean to or not.

When you do this, the brains of your listeners will be searching for a new tonal centre—even though they aren't conscious of it.

So if you don't understand how to handle switching tonal centres, you're likely to confuse (and alienate) your audience.

As you'll see in Chapter 6, it's a lot easier and faster to switch tonal centres—to modulate—when you use chord changes to accompany melodic moves, because chords wield multi-tonal power.

Try out these examples of modulation:

1. Play the chord C major on your guitar or piano for a few bars, while humming the note G.

Now change to the chord E major while simultaneously changing your humming-note to G♯.

2. Play the chord C♯ minor while simultaneously humming the note sequence:
   E,
   then down to C♯,
   then down to G♯,
   then back up to C♯,
   then back to E.

   Repeat this E – C♯ – G♯ – C♯ – E tune a few times.

   Now change the chord to C major, while simultaneously changing the tune to E – C – G – C – E.

5.5.5 KEYS IN COZY RELATIONSHIPS

The more notes two keys have in common, the more closely they're related. Coziness of relationship between keys plays a big role in modulation. Keys that share the identical set of notes have the coziest relationship—the majors and their relative minors.

For example, the key of C major and A (natural) minor use exactly the same seven notes. The two keys are simply organized around two different tonal centres.

Equally important are keys that have all but one note in common—six out of seven notes. For example, the key of C major has these seven notes:

C D E F G A B

The key of G major has these seven notes:

G A B C D E F♯

Six out of seven notes belong to both keys. So the keys of C major and G major have a cozy relationship.

Similarly, the key of F major has these seven notes:

F G A B♭ C D E

Six out of seven notes belong to both the key of C major and the key of F major. So the keys of C major and F major also have a cozy relationship.

Every key (major or minor) has a close relationship with five other keys (out of a total of 24 keys). Specifically, every key has a cozy relationship with:

1. Its relative minor or major key. The scales of both keys use the same seven notes (e.g., key of C major and key of A minor);

2. The key whose tonic note is scale degree 5. The scales of both keys have six out of seven of the same notes in common (e.g., key of C major and key of G major);

3. The relative minor or major of the key whose tonic note is scale degree 5. The scales of both keys have six out of seven of the same notes in common (e.g., key of C major and key of E minor);

4. The key whose tonic note is scale degree 4. The scales of both keys have six out of seven of the same notes in common (e.g., key of C major and key of F major);

5. The relative minor or major of the key whose tonic note is scale degree 4. The scales of both keys have six out of seven of the same notes (e.g., key of C major and key of D minor).

5.5.6 OCTAVES AND FIFTHS: SIMPLE FREQUENCY RATIOS, CLOSE RELATIVES

Overtones and their frequency ratios (yet again) underlie close key relationships. The frequency ratios of the first few overtones of any fundamental tone correspond mostly with scale degrees 1 and 5, which have the two simplest frequency ratios, 2:1 and 3:2, respectively (Table 31 below).

Consider, for example, three fundamental tones, C, G, and F, and their overtones. The note G appears as two of the first five overtones of the fundamental tone C. The note G also appears as two of the first five overtones of the fundamental tone G itself.

Just as G is scale degree 5 of C, so C is scale degree 5 of F. Therefore, as expected, The note C appears as two of the first five overtones of the fundamental tone F. The note C also appears as two of the first five overtones of the fundamental tone C itself.

To generalize, any two keys (and their relative major or minor keys) whose *tonic notes are an interval of a perfect fifth apart*, such as C and G (G is scale degree 5 of the

key of C) or F and C (C is scale degree 5 of the key of F) have a close and special relationship.

TABLE 31 Overtones and "Fifth" Relationships

Tone / Overtone	Multiple of Fundamental	Freq. Ratio	Associated Scale Degree	Examples: Tones in Key of ... C	G	F
Fundamental	1 (f)	1 : 1	1	C	G	F
1st Overtone	f x 2	2 : 1	1	C	G	F
2nd Overtone	f x 3	3 : 2	5	G	D	C
3rd Overtone	f x 4	2 : 1	1	C	G	F
4th Overtone	f x 5	5 : 4	3	E	B	A
5th Overtone	f x 6	3 : 2	5	G	C	C

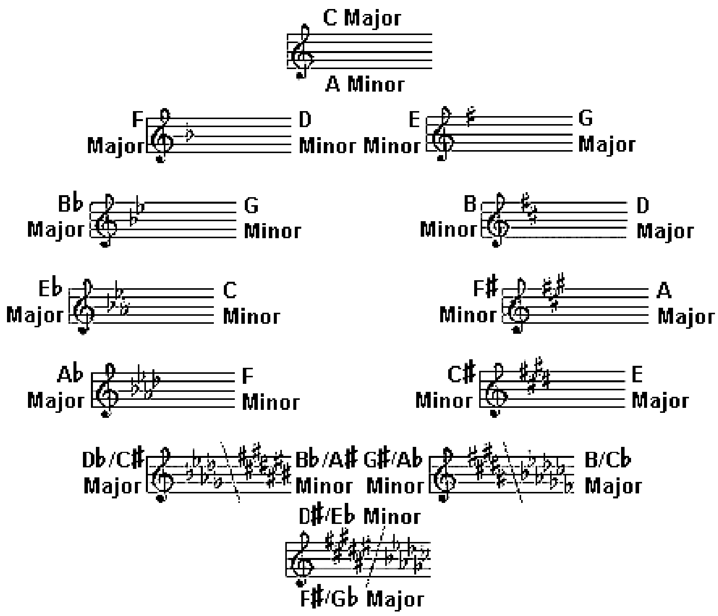
5.5.7 WHY HEINICHEN'S CIRCLE OF FIFTHS, WHILE SOMEWHAT USEFUL, IS OFTEN MISUNDERSTOOD AND MISUSED

We owe a small debt of gratitude to German music theorist and prolific but under-appreciated composer, Johann David Heinichen, who, in 1728, published the Circle of Fifths. This simple "clock face" shows the special relationships between keys with tonic centres a fifth apart (Figure 40 below).

If Mr. Heinichen were to rise from his grave today, who knows how many thousands (or, perhaps dozens) of songwriters and composers would show up and form a queue leading to his tombstone to shake his hand and thank him for his somewhat useful musical clock face.

And also to ask him, by the way, if there's life after death, what it's like if there is, why did he rise from his grave, and would he like to stay or go back.

FIGURE 40 Heinichen's Circle of Fifths



The bottom three elements of the Circle of Fifths show *enharmonic keys*. For example, F♯ major is the enharmonic equivalent of G♭ major.

The Circle of Fifths shows the *key signature* for each key—the sharps or flats that belong to the key. The key signature shows you which notes to sharpen or flatten when you play in a key, so that you maintain the diatonic interval order for the key (e.g., tone, tone, semitone, tone, tone, tone, semitone—the diatonic order for all major keys).

Looking at the top of the Circle of Fifths, you can see that the keys of C major and A minor have no sharps or flats, so there's just a treble clef with no sharps or flats. As you move down each side of the Circle of Fifths, the number of sharps and flats increases by one, for each successive key.

For any key in the circle, the *adjacent keys* (major or minor modes) are the keys *most closely related.* For example, look at the key of A major on the right side of the Circle of Fifths. The adjacent keys, D major and E major, are the keys most closely related to A major. That means D major and E major share six out of seven of the same notes as A major. To confirm this, have another look at Table 24.

Is the Circle of Fifths useful if you don't read music?

In a word, yes.

For example, you can use the Circle of Fifths to find out the key of a song when you use a book of lead sheets that show the song's basics— chords, lead vocal melody line, and words. Suppose the lead sheet of a song has a key signature with four sharps. The Circle of Fifths tells you that the song must be in the key of either E major or C♯ minor. The chords will make it pretty obvious which of these two keys prevails.

It's easy to overestimate the usefulness of the Circle of Fifths. It has its place as a device for identifying keys, but it's not something you need to regard as an essential tool.

A lot of musicians mistakenly think the Circle of Fifths has something to do with chords and chord progressions. Sadly, they labour for weeks, months, and yea, even years of their lives, 16 hours a day, miserably attempting to reconcile the data in the Circle of Fifths with odd notions of chord construction and progressive harmonic intervals. Or something.

In Chapter 6, you will get to know another circular device that looks a bit like the Circle of Fifths but is much, much more useful. It's called the *harmonic scale*.

5.5.8 TONALITY AND TONAL MUSIC

Also in Chapter 6, you'll learn that, when you modulate, you don't have to stick to closely-related keys, such as adjacent keys in the Circle of Fifths. In fact, it's often harder to move the tonal centre (i.e., modulate) to a closely-related key because the two keys have so many notes in common. This sometimes makes it difficult for your listeners to figure out which key you're in. For this reason, a successful modulation usually takes several measures.

Have another look at the Circle of Fifths (Figure 40 above). The further apart the keys are on the circle, the less closely they're related. For example, the key of C major is more closely related to the key of G major than to the key of E♭ major.

Modulation to a distant or unrelated key often enlivens a piece of music substantially—if done skilfully. Modulation introduces the element of surprise.

IT'S NOT ONLY NBA PLAYERS WHO PIVOT

As you'll discover in Chapter 6, more often than not, a modulation requires something called a *pivot chord*. A pivot chord is a chord that has one role in the original key, but a different role in the new key.

The melody usually moves chromatically in conjunction with a chord change to the pivot chord. This enables the tune and its harmony to magically pivot like an NBA player out of the original key and into one of 23 other possible keys.

Sometimes a series of chord changes and melodic moves will pivot the tune quickly through a series of keys: a *modulation chain*. These are called *transient modulations*, and normally result in the tune finally setting up shop in a new tonal centre.

Before you can modulate, you first have to establish a tonal centre. There's a term that encompasses everything that goes into establishing a tonal centre. That term is *tonality*.

Music based on 24 keys, equal temperament, and tonality is usually referred to as *tonal* music, or sometimes *Western tonal music*.

The great majority of the popular music of the West is tonal music, including nearly all 5,000 songs on the GSSL. (And the music of composers such as Bach, Handel, Mozart, Beethoven, Chopin, and Tchaikovsky.)

Tonality refers to all of the organized relationships of pitches around a key note or tonic centre, including:

- The *tonic note* or key note itself
- The *scale* named for, and related to, the tonic note
- The *chords* related to the tonic note

Just think of "tonality" as meaning the same thing as "key."

For instance, if you pick up your guitar or sit down at your piano and

- Play the *chord* C major for a few bars, while you
- Hum or sing a tune comprised of *notes* from the C major scale (C D E F G A B),
- Including the *tonic note*, C,

then you're playing and singing in the *tonality of C* or the *key of C*.

This concept is vital with respect to modulation because, to modulate successfully, you have to first establish one tonality, then move tonality to a different tonal centre (change keys), then—usually—return to the original tonality.

If you don't know what you're doing, this process can get dicey because:

- There are 24 possible keys (12 major, 12 minor), and your listener's brain can only make sense of the tonal relationships of *one key at a time—one tonality*. (Well, usually. In Chapter 6, a brief analysis of the song "Gimme Shelter" illustrates how two tonalities can coexist simultaneously.)

- Those 24 keys are all based on a selection of the *same* 12 pitches *only* (the individual notes of the chromatic scale), so if you're playing in a given key and you introduce chords and notes from other keys without knowing what you're doing, you can easily *muddy the tonality* and confuse the listener's music processing modules.

When your melody emphasizes certain notes of the scale, such as 1, 3, and 5, and when you play certain chords, such as the chord built on the key note (the chord C major in the key of C major), you're establishing tonality in the collective mind of your audience. (They don't know consciously that you're doing this, of course.)

Once you've established tonality, your listeners expect that the notes to follow will be related to the tonal centre in simple frequency ratios—the notes of the diatonic scale for the key you're in.

When you're composing a tune, with the intention of modulating, you have to firmly establish tonality *early*. A song runs only three or four minutes. You can't successfully move to a different key until your listener's brain has first locked into the identity of the original tonality.

Most songs have an instrumental introduction of four, eight, or sixteen bars. One of the main reasons for having that instrumental introduction is to establish tonality.

5.5.9 DISTINGUISHING TONAL MUSIC FROM MODAL MUSIC AND ATONAL MUSIC

You might consider modal music as a kind of tonal music, but only in a decidedly restricted sense. Each of the modes has a tonic note and a scale based on small integer frequency ratios.

But ...

- For reasons discussed earlier, the true sense of a tonal centre doesn't materialize in modal scales;

- True modal chords and chord progressions are seriously problematic. This is explored towards the end of Chapter 6.

Nevertheless, modal scales *can* be put to good use in Western tonal music, as you'll see in later chapters.

Then there's *atonal music*. No diatonic order, no tonal centre, no tonality.

Atonality refers to music composed deliberately without a tonal centre. It's usually associated with, among others, Arnold Schoenberg and his *serial* system. Serial

composers seek to compose music with every note having the same importance, *avoiding* the likelihood of the listener recognizing a tonal centre. The result, *atonal music*, is practically unlistenable except by a hardy minority of masochists. But Schoenberg and the atonalists deserve credit for bravery, attempting as they did (unwittingly) to modify preferences in the human brain that evolved over millions of years.

Hardly anybody actually listens to atonal music because of the near exclusion of small-integer ratio intervals in melody and harmony. The brain hears atonal "music" as chaotic, irritating static.

The brain responds to small-integer-ratio tunes. That's biological reality. It's inborn, true of infants, true of adults, and applies cross-culturally.

Brain recognition of organized relationships of tones is not a science or technology. It does not become obsolete with the invention of "upgraded tonal technology" such as atonal composition. Tonality is linked in the brain directly with *human emotions*, which have not changed from generation to generation for many thousands of generations.

5.5.10 EMOTIONAL EFFECTS OF TONALITY

Table 32 lists a few emotions found to be associated with clear vs unclear tonality (and atonality).

Even if you're playing in what you think is a major key, and are deliberately trying to express positive emotions, your music may unintentionally have negative emotional effects on the audience if tonality is unclear and you don't realize it.

On the other hand, if you *want* to express negative emotions musically, you can certainly put unclear tonality (or atonality) to good use.

TABLE 32 Emotional Effects of Tonality

Tonality Characteristic	Associated Emotions
Clear tonality (major or minor mode)	Happiness, sadness, tenderness, joy, peace
Unclear tonality (highly dissonant)	Fear, sadness, anger
Atonality	Anger

PART III

HOW TO CREATE EMOTIONALLY POWERFUL MUSIC AND LYRICS

6

How Chords and Chord Progressions REALLY Work

I've heard there was a secret chord
that David played to please the Lord
but you don't really care for music, do ya?
It goes like this: the fourth, the fifth,
the minor fall, the major lift;
the baffled king composing Hallelujah!
—LEONARD COHEN ("Hallelujah")

6.1 Where Chords Come From

6.1.1 What's a Chord?

For practical purposes, think of a chord as *three or more* different-pitched notes played or sung simultaneously. Not two. Consider *two* notes, whether sounded simultaneously or in succession, an *interval*.

Successions of chords—chord progressions—are the units of harmony. Just as successions of intervals are the units of melody.

Psychologically, as discussed in Chapter 3, harmony provides aural "depth" to melody's height and rhythm's length. Harmony has nothing to do with pitch-like "height." You'll find out why later in this chapter.

6.1.2 The Jimi Hendrix Experience without Jimi: Why Melody-free Harmony Does Not Stand on its Own

When you play a melody comprised of the notes that make up a chord, such as C – E – G – E – C, your brain recognizes the underlying chord because the sequence goes by quickly. But when you play all the notes of a chord simultaneously, your brain hears a single unified sound—*not* the individual notes that comprise the chord.

You can recognize a tune—a succession of notes—as a piece of music all by itself. No harmony whatsoever. A national anthem, or "Happy Birthday," or a bugle call, for instance.

And yet, paradoxically, a harmonic progression—a succession of *chords* without a tune—does not sound like "complete" music at all. It sounds like the Jimi Hendrix Experience without Jimi.

Unlike harmony-free melody, melody-free harmony does not stand on its own.

If you were to play the *chords* to "The Star Spangled Banner" without playing or singing the succession of pitches that forms the tune, no one would recognize it as one of the world's most widely-known songs.

On the other hand, a lone, completely unaccompanied tune is like a movie storyboard—a sequence of sketches, much like the sequence of panels forming a comic strip. The storyboard outlines the shot-by-shot sequence of a scene—the essentials of the "story" for that scene. You can discern what the story is from the storyboard, but it lacks color, depth, and liveliness.

6.1.3 Harmony's Own Organizing Principle

Chapter 4 discussed the "organizing principle" that underlies the construction of brain-friendly, "musical"-sounding scales: use the simple ratios of frequencies of the

harmonic series, such as 2:1, 3:2, and 4:3, to define the notes. When you do that, you get Pythagorean scales, including the scales of the diatonic order.

Is there a similar organizing principle that applies the construction of brain-friendly, musical-sounding *chords*?

Yes there is.

But with chords, it's a matter of "organizing," so to speak, the scale degrees associated with the overtones of the harmonic series, instead of the overtones themselves.

Recall that the term "scale degree" refers to the designation of the notes of a major or minor diatonic scale using numbers: 1, 2, 3, 4, 5, 6, 7, and 1 (8), where 1 is the tonic note of the scale, 7 is the leading tone, and so on. It turns out that most of the strong overtones—1st, 2nd, 3rd, 4th, 5th, 7th, and 9th—of a given fundamental tone (scale degree 1) correspond to the pitches associated with scale degrees 1, 3, and 5 of the major diatonic scale (Table 33 below). And when you play these three scale degrees—1, 3, and 5— simultaneously, you get a chord.

TABLE 33 Fundamental and First 9 Overtones of the Tone "C"

Tone / Overtone	Multiple of Fundamental	Freq. Ratio	Associated... Scale Degree	Note	Consonant/ Dissonant
Fundamental	1 (f)	1 : 1	1	C	Consonant
1st Overtone	f x 2	1 : 2	1	C	Consonant
2nd Overtone	f x 3	2 : 3	5	G	Consonant
3rd Overtone	f x 4	1 : 2	1	C	Consonant
4th Overtone	f x 5	4 : 5	3	E	Consonant
5th Overtone	f x 6	2 : 3	5	G	Consonant
6th Overtone	f x 7	5 : 9	♭7	B♭	Dissonant
7th Overtone	f x 8	1 : 2	1	C	Consonant
8th Overtone	f x 9	8 : 9	2	D	Dissonant
9th Overtone	f x 10	4 : 5	3	E	Consonant

When you play the notes C, E, and G (scale degrees 1, 3, and 5) simultaneously on your guitar or piano, you hear a beautiful harmonic sound. It's the *major triad*, so-called because it consists of three notes (scale degrees 1, 3, and 5) of the major scale. Specifically, it's the C major triad or C major chord.

This simple triad forms the basis of all harmony in the Western tonal system.

6.1.4 PROPERTIES OF THE MAJOR TRIAD (THIS LOOKS FAMILIAR)

When you hear a major triad, your brain interprets it as a single, unified sound, even though the chord consists of three different pitches played or sung simultaneously. The phenomenon of a unified "chord" sound is analogous to the unified "tone" sound you hear when someone plucks or plays a single note (Table 34).

TABLE 34 Comparing the Properties of a Single Tone with the Properties of a Chord (Major or Minor Triad)

A Single Tone ...	A Chord (Major or Minor Triad) ...
Consists of a fundamental tone plus a series of overtones at higher pitches.	Consists of a *root* note (so-called because it's the chord's lowest note, scale degree 1) plus additional notes (scale degrees 3 and 5) at higher pitches (in the chord's "root" position).
Most of the overtones are different notes from the fundamental (i.e., not in an octave relationship).	The other notes of the chord are different notes from the root (i.e., not in an octave relationship).
The fundamental and all the overtones occur simultaneously.	The root and the other notes are played or sung simultaneously (usually).
Although you don't hear the separate overtones, your brain nevertheless recognizes and processes them.	Although you don't hear the notes as separate pitches, your brain nevertheless recognizes and processes them.
The overtones create "tone color," which enables you to distinguish the difference between the sound of, say, a guitar, from the sound of a piano.	Sounded together, the notes of the triad create "harmony," which imparts a feeling of color and depth to music.

Without the context of a key, the sound of a tone is "at rest"—no tension.	Without the context of a key, the sound of a triad is balanced and stable—no tension.

When you think about it, then, a single vibrating string or membrane contains within it all of the acoustical components of both melody and harmony:

- It incorporates the same ratios of frequencies that yield all the major and minor scales of the diatonic order.

- It includes the same scale degree notes, sounded simultaneously, that correspond to the root and the other notes of the major triad and other chords.

Once your brain had evolved the circuitry to distinguish simple ratios of frequencies from each other, it also had the necessary built-in capability to automatically process intervals, tunes, keys, and chords.

It was probably inevitable that at some point in human history musicians would eventually discover and develop Pythagorean-type scales and associated harmony that made possible Handel's "Messiah," Gershwin's "Someone To Watch Over Me," and John Lennon's "In My Life."

6.1.5
EXPLORING THE INNARDS OF THE MAJOR TRIAD

Have a look at Table 35 below. When you play a C major triad, here's what the music modules in your brain actually pick up and process (fundamental and strongest overtones):

1. The "C" fundamental, together with a series of overtones, including C itself (repeated several times as an overtone), plus the notes E and G.

2. The "E" fundamental, together with a series of overtones, including E itself (repeated several times as an overtone), plus the notes G♯, and B.

3. The "G" fundamental, together with a series of overtones, including G itself (repeated several times as an overtone), plus the notes B, D, and other overtones.

TABLE 35 Fundamental and First Five Overtones of C Major Triad

Tone / Overtone	Multiple of Fundamental	Freq. Ratio	Associated Scale Degree	C Major Triad		
				C	E	G
Fundamental	1 (f)	1 : 1	1	C	E	G
1st Overtone	f x 2	1 : 2	1	C	E	G
2nd Overtone	f x 3	2 : 3	5	G	B	D
3rd Overtone	f x 4	1 : 2	1	C	E	G
4th Overtone	f x 5	4 : 5	3	E	G♯	B
5th Overtone	f x 6	2 : 3	5	G	B	D

- In the "C" column, you can see that all three notes of the C major triad (C, E, and G) appear as overtones of the single C tone.
- In the "C" and "G" columns, both the E tone and the G tone of the C major chord add the overtone corresponding to scale degree 7 (the note B). This is the scale degree associated with the semitone interval that "points" strongly at C (scale degree 1): the leading tone.
- Other overtones include D, which also points strongly at C, and G♯, which seeks to resolve to G (scale degree 5).

So, when you play the notes C, E, and G simultaneously on your guitar or piano (forming a chord, a major triad), all of the overtones common to the three tones *reinforce each other*. This is the acoustical phenomenon called *resonance*, discussed in the Section 3.3 on musical instruments and how they work.

The major triad is a completely balanced, satisfied-sounding chord that doesn't want to go anywhere.

MORE POTENTIAL MIXED UP CONFUSION

Chords have ***roots***, whereas scales and keys are centred on ***tonic notes.*** Do not refer to the first note of a scale as a "scale root"—there's no such thing. Scales *do not* have roots. *Chords* have roots.

As you'll see shortly, a chord is named for its root note. When the root note of a chord happens to be the same note as the tonic note of a scale, that chord is called the *tonic chord*.

6.1.6 STACKING INTERVALS, THEN TURNING THEM UPSIDE DOWN AND DISTURBING THEM

The three notes of the major triad are called the *root*, the *third*, and the *fifth*. As long as you play these three notes simultaneously (more or less) ...

1. It doesn't matter which *octave* you play them in;
2. It doesn't matter which *order* you play them in.

Your brain will still recognize the same chord.

Although recognizably the same chord, the order of the component notes does affect the overall sound of the chord.

1. If the root of the chord is "at the bottom"—in the lowest pitch position—the chord will sound completely balanced. This is called *root position*.

2. If the third is at the bottom, the chord will sound, paradoxically, balanced and yet somehow distinctly disturbed. (You'll see why in a minute.) This is called the *first inversion*.

3. If the fifth is at the bottom, the chord will sound balanced, but still slightly disturbed, compared with root position. This is called the *second inversion*.

All chords are just stacks of intervals—major and minor thirds. Any time you pile thirds on top of each other, *in any combination*, you get chords. The intervals have to be *thirds*.

6.2
Triads and Sevenths: The Foundation of All Western Tonal Harmony

6.2.1
RESTLESS INTERVALS MAKE RESTLESS CHORDS

If the chord contains only consonant intervals, it will sound consonant. But if it contains even one dissonant interval, the whole chord will sound dissonant (Table 36 below; Figure 41 below).

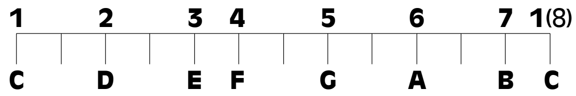
TABLE 36 Consonant and Dissonant Intervals

Interval	Number of Semitones	Example	Consonant/ Dissonant
Minor Second	1	**C – C♯**	**Dissonant**
Major Second	2	**C – D**	**Dissonant**
Minor Third	3	C – E♭	Consonant
Major Third	4	C – E	Consonant
Perfect Fourth	5	C – F	Consonant
Aug 4th or Dim 5th	6	**C – F♯**	**Dissonant**
Perfect Fifth	7	C – G	Consonant
Minor 6th or Aug 5th	8	C – A♭	Consonant
Major Sixth	9	C – A	Consonant
Minor Seventh	10	**C – B♭**	**Dissonant**
Major Seventh	11	**C – B**	**Dissonant**
Octave	12	C – C	Consonant

The chord C major in root position (C, E, G) consists of a major third interval (C – E) with a minor third interval stacked on top (E – G). Two consonant intervals. (These are called the *internal intervals*.)

The interval from the root to the top note (C – G) is a perfect fifth, also consonant. (This is called the *outer interval*.) See Figure 41.

FIGURE 41 Intervals—C Major Scale



The chord C major in first inversion (E, G, C) consists of a minor third (E – G) with a perfect fourth stacked on top (G – C). Two consonant internal intervals. The outer interval (E – C) is a minor sixth, also consonant.

The chord C major in second inversion (G, C, E) consists of a perfect fourth (G – C) with a major third stacked on top (C – E). Two consonant internal intervals. The outer interval (G – E) is a major sixth, also consonant.

Everywhere you look, nothing but consonant intervals. So why the heck don't the first and second inversions sound balanced and "consonant," like the chord in root position?

6.2.2
THE PARADOX OF UNSETTLED-SOUNDING CONSONANT INVERSIONS

Here's what happens. In a chord, whichever note occupies the *bass position* with respect to the other notes of the chord will carry more harmonic weight by virtue of its necessarily more powerful (loud) fundamental and overtones (i.e., compared with the fundamentals and overtones of its higher-pitched chord-mates).

In fact, the lowest note of a triad with respect to the other two notes wields so much power over the sound of the chord that the distribution of the other two notes doesn't really matter.

For example, in first inversion, the order of the notes could be either E, G, C or E, C, G. The chord will still have a characteristic "first inversion" sound (in this example, the sound of "the chord C Major with E in the bass").

In the context of a scale, every note is unbalanced to some degree, with respect to either scale degree 1 or 1 (8). Except, of course, scale degrees 1 and 1 (8) themselves, with respect to each other. So, having an *unbalanced* chord note (third or fifth) in the *bass position* (as is the case with first and second chord inversions) creates a certain amount of disturbance in the sound of the chord, despite the absence of dissonant intervals.

To a hear a completely balanced, completely stable, completely consonant triad, you have to play it in root position.

6.2.3
THAT MOODY MINOR SOUND AGAIN

To get a major triad, such as the C major chord, you stack two "third" intervals on top of each other. A major third interval (four semitones) goes on the bottom, and a minor third interval (three semitones) sits on top. Note that the minor third interval has scale degree 3 as its bottom note.

To get a minor triad such as the C minor chord (C, E♭, G), you flip the two intervals. The minor third goes on the bottom, the major third on top. Now the minor third interval (C – E♭) has scale degree 1 as its bottom note.

The minor chord sounds stable, at rest ... except ... it has that spooky "minor" sound. When you play a C major chord followed immediately by an C minor chord, you hear, unmistakably, a drastic difference in perceived mood.

Recall the discussion in Chapter 5 about the three versions of the minor scale. It doesn't matter which scale you use—natural minor, melodic minor, or harmonic minor (or "grand minor")—they all still retain the characteristic "minor" sound because they all have a minor third interval in relation to the tonic note (scale degree 1).

Exactly the same applies to the minor chord in harmony. The minor triad consists of exactly the same internal and outer intervals as the major triad. The only difference is that the two internal intervals are flipped the other way around, so that the minor third relates to scale degree 1 instead of the major third relating to scale degree 1. The perceived "mood" of the chord changes completely.

Unlike the major triad, the minor triad does not have all that internal overtone-reinforcement (Table 35). This could well be what causes the brain to perceive the minor triad as emotionally negative. That is, the discrepancy between what you'd expect an "ideal" triad to sound like (the sunny sound of a major triad) and what the minor triad actually sounds like (sad) could be due to lack of overtone-reinforcement. (More on chords and their emotional implications near the end of this chapter.)

6.2.4
DIMINISHED AND AUGMENTED: DISTURBED CHORDS (BUT IN A NICE WAY)

So far, you've heard the results of stacking a minor third atop a major third, creating a major chord. And stacking a major third atop a minor third (creating a minor chord). In both cases, you get a stable, balanced-sounding, consonant chord.

What happens when you stack two minor thirds, one atop the other?

A sound loaded with tension. Completely unbalanced and dissonant. Not "bad"—just unbalanced and dissonant. Even though it's comprised of two consonant intervals, this chord doesn't sound in any way self-contained, like the major and minor triads. How come?

It's that cloven-hoofed interval from Hell itself, the tritone—the most dissonant of intervals (also known as the diminished fifth), making its appearance as the chord's outer interval. The chord you get when you pile two minor thirds atop each other is the *diminished triad*, or simply the *diminished chord*.

How about stacking two *major* thirds, one atop the other?

You get another rootless, restless-sounding chord. Again, unbalanced and dissonant, but not as dark sounding as the diminished chord.

As with the diminished chord, both of the internal intervals are consonant (major thirds). The outer interval is a minor sixth, also known as an augmented fifth. Also consonant.

This chord is called the *augmented triad*. It presents yet another harmonic paradox: the augmented triad is a mighty disturbed-sounding chord, yet it's comprised *entirely* of consonant intervals, both internal and outer.

What's going on?

As discussed in Chapter 4, dissonance and imbalance usually result when you divide the octave into small equal intervals to create a scale. This is also what happens when you divide the octave into *large equal intervals*, such as three equal intervals of major thirds or four equal intervals of minor thirds.

Since the internal intervals are identical, both the diminished and augmented triads have no roots. That's why they sound so unbalanced, and that's what makes them harmonically interesting and useful.

6.2.5
THE MOST BORING TUNE IN THE WORLD

What do you hear when you play either a major chord or a minor chord in root position? A completely balanced sound. No tension.

What do you hear when you play a tune consisting of an octave interval, 1 – 1 (8), or even several octave intervals? Same thing. No tension whatsoever.

If you decided you wanted to write a monumentally boring song, how would you go about it?

- Use only octave intervals.

- Use one chord, the major triad. (Don't use the minor triad; it's too inherently emotional because of the minor third.)

- Make sure the major triad is in root position—scale degree 1 at the bottom.

Such a tune would, in the immortal words of Monty Python, send bricks to sleep.

What goes for intervals goes for chords: music doesn't begin until *dissonant chords* take the stage. At every level, what's called "music" emerges only when your brain perceives something interesting, challenging, compelling: sonic unrest, imbalance, instability.

The major or minor triad (depending on whether you're playing in the major or minor mode) serves the same purpose in harmony as the tonic note of the scale serves in melody. *It establishes and reinforces tonality*.

Deviating from the major triad to create dissonant harmony serves the same purpose harmonically as deviating from predictable scale patterns serves in melody. It creates interest and suspense. Any time you're not playing a simple triad, you're playing a dissonant chord. The ear expects that, eventually, dissonance will resolve back to consonance.

6.2.6 HARMONY'S GOTTA MOVE (COHERENTLY, OF COURSE)

Your brain cannot experience sonic imbalance without a frame of reference. It has to experience "balance" before it can perceive and appreciate imbalance. That's why a piece of music must first establish tonality. Hence, as mentioned previously, the typical four- or eight-bar instrumental introduction to a song.

Once your brain knows where scale degree 1 is, it wants to light out for the Territory of tonal tension. The road trip takes place on several sonic levels:

1. ***Movement of pitches.*** A succession of *intervals* (not individual notes) creates variety by generating tonal tension and relieving it at a fast pace.

2. ***Movement of chords.*** A succession of *chords* (chord progression) creates variety by introducing dissonances, manipulating tonal tension at a *slower pace* than the tune itself.

   A well-constructed chord progression simultaneously maintains tonal coherence by "pointing" to the tonal centre of the dynamic field.

   When chords change without purposeful direction, harmony still moves, but it doesn't seem to get anywhere. It wanders around, sounding unpalatable, lost in the desert, with vultures circling. It's Deputy Fester himself, lost,

removing his hat, fanning his face and muttering to his horse, "The tonality, the tonality ... "

3. ***Movement of keys.*** Tonicization and modulation create variety on a larger scale by taking tonality itself into parallel universes—different keys altogether. Usually (not always), tonality returns to Dodge City, like Marshal McDillon after Ms Puma forgave him and let him have his old job back because she missed the big galoot, and because she didn't want the responsibility of being the marshal and having to keep track of Deputy Fester's whereabouts.

The music in harmony, like the music in melody, has a hard time getting noticed if it does not move. Chords may move slower than the notes of a tune, but move chords must.

(Or ... not always. For instance, Bob Dylan's scary, unforgettable "Ballad of Hollis Brown" uses one chord throughout, a minor triad. Look it up on the GSSL.)

6.2.7
THAT OTHER CHORD TYPE: THE SEVENTH

So far, this chapter has discussed two flavours of one type of chord—the triad:

1. Balanced, consonant triads: major and minor chords
2. Unbalanced, dissonant triads: diminished and augmented chords

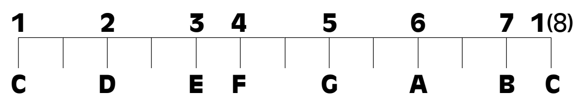
There's only one other main type of chord: the *seventh*. To get a seventh chord, you simply pile *three* "third" intervals atop each other.

Now you've got a four-note chord. Unlike basic three-note major and minor triads, *all seventh chords are dissonant*.

Here's why:

First, as an example, have another look at the intervals of the C major scale (Figure 42).

FIGURE 42 Intervals—C Major Scale



The C major chord consists of the notes C, E, G, which is made up of two consonant intervals, C – E (a major third), and E – G (a minor third). If you're going to stack on another third interval, it can only be either G – B♭ (a minor third interval), or G – B (a major third).

In either case, two things apply:

1. The last remaining note of the chord is either a flatted seventh of the scale (B♭ in this example), or a natural seventh (B). Which is why this type of chord is called a *seventh*.

2. Whether the note you add is a flatted seventh (B♭) or a natural seventh, (B), this added note will always be *dissonant* because it's either a whole tone or a semitone removed from the tonic note (C, in this example).

And you found out in Chapter 4, whole tone and semitone intervals are *always dissonant* (Table 36).

If even one interval of a chord is dissonant (internal or outer), the whole chord is dissonant. That's why ***all chords except major and minor triads are dissonant.***

6.2.8 And What about All Those Jazz Chords Such As 9ths, 11ths, 13ths?

They're just triads and sevenths dressed up in fancy duds. They all have four or more notes, so they're all *dissonant*.

In fact, you can reduce all of the substance of harmony in the Western tonal system down to two measly chord types, the *triad* and the *seventh*, and their embellishments. Imagine that ... Beethoven, Mozart, Ellington, The Beatles ... all just two-chord wonders.

To get a "ninth"-type chord, for example, you just grab another note, as though it's from the next octave up. There's nothing to stop scale degrees from continuing on, like this...

1, 2, 3, 4, 5, 6, 7, 1 (8), 2 (9), etc.

However, unlike in melody, where you have low-pitched notes (the lower end of the scale) and high-pitched notes (the upper end), *there's no such thing as a low-pitched chord or a high-pitched chord*. This concept is so important in harmony, it bears repeating in boldface:

There's no such thing as a low-pitched chord or a high-pitched chord.

A chord is just a chord, as you'll find out later in this chapter.

Meanwhile, the best way to envision where the notes come from to create *extended chords* such as 9ths, 11ths, and 13ths is to consider octaves as "overlapping." So, for example, in the key of C,

the note "C" is scale note 1
the note "D" is scale note 2
the note "E" is scale note 3

When you get to the end of the scale (the "C" at the end of the octave is the 8th note of the scale), you just continue on with higher numbers. So the note "D" becomes the 9th note of the scale, in addition to being the 2nd note. The note F becomes the 11th note (in addition to the 4th), etc. Like this:

C	**D**	**E**	**F**	**G**	**A**	**B**	**C**
1	2	3	4	5	6	7	1 (8)
	9		11		13		

For example, here are the component notes of some seventh and ninth chords ...

- The chord C7 (C seventh) is comprised of these notes played simultaneously:

  C E G B♭

  The term "seventh chord" always means that the seventh note of the scale is a *flatted* seventh.

- The chord CM7 (C major seventh) is comprised of these notes played simultaneously:

  C E G B

  The term "major seventh chord" always means the seventh note of the scale is a *natural* seventh (not flatted).

- The chord C9 (C ninth) is comprised of these notes played simultaneously:

  C E G B♭ D

  The "seventh" chord (the four-note chord with the *flatted* seventh) is the underlying chord, and the "ninth" note (the D) is added.

With this chord, or any chord, the arrangement of the notes can be in *any order*, because there's no such thing as a low-pitched chord or a high-pitched chord. The chord remains the same chord. For example, you could play the above C9 chord on the piano as above, or you could play it like this:

C G B♭ D E

or like this:

E B♭ D G C

It's still the same C9 chord. You'll see why in the discussion coming up about how chords actually change.

- The chord CM9 (C major ninth) is comprised of these notes:

  C E G B D

  This one is called a "major ninth" chord because the underlying chord is a major seventh (the chord with the *natural* seventh). The "ninth" note (the D) is added to create the chord *C major ninth*.

- The chord Cm9 (C minor ninth) is comprised of these notes:

  C E♭ G B♭ D

  In this case, the chord is called a "minor ninth" because the underlying chord is a minor chord (actually a minor seventh chord, Cm7).

The nomenclature of such chords comes from the application of a few basic rules. If the name of the chord has the word ...

- "minor" in it, such as "C minor seventh" (Cm7) or "C minor ninth" (Cm9), then it's a *minor triad,* usually with an added *flatted seventh* (and more notes may be added)

- "major" in it, such as "C major seventh" (CM7) or "C major ninth" (CM9), then it's a *major triad*, usually with an added *natural seventh* (and more notes may be added)

- "suspended" in it, such as "C suspended fourth" (Csus4) or "C suspended second" (Csus2), then it's a triad in which the note in scale position 3 has

been removed and replaced with the note in scale position 4, or 2 (e. g., instead of C, E, G, you'd have the notes C, F, G or C, D, G, respectively)

To get extended 9th, 11th, and 13th chords, all you do is stack more thirds atop the underlying 7th chord.

- If you pile a third on top of a 9th, you get an 11th chord:

C11 = C E G B♭ D F

- If you pile a third on top of an 11th, you get a 13th chord:

C13 = C E G B♭ D F A

Now you've got six- and seven-note chords. So you need two hands to play them on the keyboard. As for six-string guitar, to play a 13th chord, you have to *leave out* one of the notes (normally the 11th).

Your brain processes 9th, 11th, and 13th chords as though they're some fancy species of 7th chords. All such chords are dissonant.

Just keep in mind that *all chords are triads and sevenths*, or variations of triads and sevenths.

These extended chords are common in jazz and romantic music of the 19th Century.

WHAT IS THAT MYSTERIOUS BEATLES CHORD?

It's one of the most famous chords in rock music. That "krrraannggg!" chord right off the top of the Beatles' classic, "A Hard Day's Night."

What is that chord?

No one in the Beatles' organization would tell. Not even George Martin. So, arguments raged for decades about the mysterious chord. Fights broke out in the streets of Wichita and Dodge City. Frightened horses galloped away in clouds of dust. Doc Yada-Yadams spent hours treating the injured and sipping hooch from his still. Nobody could agree on the identity of that chord. Even Ms Puma, who normally knows everything, had to admit she was stumped.

Finally, from out of the frozen northern wastelands of Nova Scotia, Canada, a stranger rode into town, a mathematics

professor named Jason Brown. And what did the stranger do? Why, he took off his hat and tossed it on a peg, and then he sat down at a computer and digitized that dang chord real good. And then Dr. Brown spent six months deconstructing it. When it was all over and the dust had settled, the mathematical stranger had solved the mystery.

What did Dr. Brown find?

- George Harrison played the notes D, A, C, and G on his 12-string Rickenbacker electric guitar.

- Paul McCartney played the note D on his bass.

- George Martin played the notes D, F, E, and G on the piano.

- John Lennon may have played the note C on his 6-string guitar.

- Put them all together and you get: D F A C E G, which is the chord Dm11 (D minor eleventh), which is the same as the chord D minor (D F A) and the chord C major (C E G) played simultaneously.

The next chord on the record is the tonic chord, G major, which begins the verse. The Dm11 chord, then, is a jazzy variant of the dominant seventh chord.

Some ornery folks dispute Dr. Brown's findings. Marshal McDillon was thinking seriously of locking them all up for the commotion they cause, because that's a cliche of law 'n' order in a Classic Western like this one. Then Ms Puma wisely reminded Marshal McDillon of the importance of free inquiry. She poured him a double bourbon and he drunk it down in one swallow and didn't cough like the late Billy Joe up there on Boot Hill.

6.2.9 SLASH CHORDS

In most song books showing words and chords, or words, melody line, and chords, you will see chord notations such as these:

C/A
G/D
D/F♯

These chords are called *slash chords*, as in "C slash A" or "G slash D". Although musicians usually say, "C over A" or "G over D".

In slash chord notation, such as G/D:

- The note *before* the slash signifies the actual *chord* (in this example, the chord "G").

- The note *after* the slash is a *bass note* (in this example, the bass note "D") played simultaneously with the chord.

Therefore, a slash chord is not generally considered to be a "unique" chord. Literally *any chord* can be turned into a slash chord.

If the bass note following the slash is one of the notes in the chord itself, then you just need to make sure the note following the slash is the lowest note in the chord.

For example, G/D means:

> "Play an ordinary G major chord and make sure the lowest note (the bass note) is D."

If the bass note following the slash is *not* one of the notes in the chord itself, then the note following the slash is just a bass note that you *add* to the chord.

For example, C/A ("C over A") means:

> "Play an ordinary C major chord and at the same time, add an A note as a bass note."

You can play the added "A" in the bass on your own instrument (guitar or piano). Or, alternatively, your bass player can hit the "A" bass note as you simultaneously play the "C" major chord. The musical effect is the same.

The bass note following the slash can be *any* of the 12 notes in the chromatic scale. It does not have to be even remotely related to the chord.

So, for instance, you can play "slash chords" such as D/E♭ or D/C. When the bass note following the slash is not a note in the chord itself (for example, the "A" in C/A), it's often a brief passing note as you step through a series of chords, such as the chord progression C – C/A -- F.

You can add any bass note to any chord under the sun and call it a "slash chord." For example, major chords:

D/E♭
D/E
D/F
D/F♯
D/G, etc. etc.

Or minor chords:

Dm/E♭
Dm/E
Dm/F
Dm/F♯, etc. etc.

In musical composition generally, and harmony particularly, the bass part plays a central role in establishing and maintaining tonality, and also in signalling changes in melodic and harmonic direction. That's where the bass power of slash chords can be useful.

6.2.10
POWER CHORDS (NOT TO BE CONFUSED WITH POWER CORDS)

A power cord is cable that connects an appliance such as a guitar amp to a power source such as a power bar or wall socket.

A power *chord* is a type of chord that had to be invented after electric guitar players started overdriving preamplifiers and speakers to create massively distorted sound. Heavy metal, heavy rock, and punk music characteristically employ power chords.

The legendary rock guitarist Link Wray is generally credited with inventing the power chord. He pioneered the use of distortion and feedback in electric guitar playing. For example, he would deliberately punch holes in the speakers of his guitar amp in order to achieve a satisfactorily distorted sound.

Recall earlier in this chapter, the following distinction:

> For practical purposes, think of a chord as *three or more* different-pitched notes played or sung simultaneously. Not two. Consider *two* notes, whether sounded simultaneously or in succession, an *interval*.

The power chord is the exception. A power chord consists of only two different notes played simultaneously, the tonic and fifth notes of the scale.

- The root of the power chord (tonic note of the scale) is usually in the lower-pitched position.
- However, the fifth may be in the lower-pitched position.
- The root may be doubled, an octave higher or lower.
- The fifth may be doubled, an octave higher or lower.

The defining property of a power chord is that the third is missing. The reason has to do with distortion. If you play an ordinary major or minor triad on an electric guitar through an amp with tons of distortion, the overtones are so muddied-up that your brain has a hard time figuring out that it's even hearing a chord, let alone what kind of harmony it's supposed to be. All your brain can discern is formless noise.

However, if you *leave out the third*, then your brain can usually distinguish a basic harmonic interval, a perfect fifth—even with all the distortion. Although it's only an interval, and not a chord in the normal sense of the word, at least it is harmony. The *overwhelming dissonance* of the electronic distortion provides the sense of power (see "Emotional Effects of Intervals," Chapter 4).

Since power chords consist of only two different notes, you can learn to play them pretty easily. You can finger a power chord anywhere on the guitar fretboard. But without a doubt, the heaviest, darkest, most powerful sounding power chords are those you play on the *bass strings*. Low pitch plus massive dissonance combine to create a dark, ominous feeling.

A couple of final points about power chords:

- A power chord is usually symbolized by combining the letter-name of the root note with the number 5. For example:

  C5 or C fifth

- Since the third is missing, you can't tell whether the prevailing mode is major or minor. Heavy metal songwriters exploit this characteristic by making use of the Church modes for melodic purposes, resulting in a distinctive or signature sound.

6.2.11 DRONE ON

Before continuing on to chord progressions, a word or two about harmony by drone—ubiquitous in some musical cultures.

Western Europeans did not "discover harmony" in the 16th and 17th centuries by developing the Western tonal system, with its 12 major keys, 12 minor keys, and equal temperament. Our ancestors doubtless were harmonizing vocally tens of thousands of years ago.

Instrumentally, drone-based harmonic systems have existed for ages. The major difference between drone-based harmonic systems and the Western tonal system is that you can't change key while playing a drone-tuned instrument. You have to stop and retune.

A drone is a sustained note (or group of notes) that accompanies a developing melody. Drones can take several forms:

- A single note
- Two or more notes of identical pitch
- Two or more notes pitched in octaves
- Two notes in related pitches

Sometimes the drone note sounds continuously:

- Various kinds of bagpipes.
- Hurdy gurdy: the player cranks a wheel that vibrates strings that sustain the drone note.

Sometimes a musician strums or plucks a single note rhythmically (a "rhythmic drone") to sustain the drone effect and also provide rhythmic accompaniment.

While normally instrumental, some drone traditions feature vocalists singing drone syllables.

Drone sounds are found in many of the world's musical cultures:

- Indian classical music
- Jew's harp (jaw harp) playing
- Fiddle traditions such as Celtic, eastern European, and Appalachian
- Australian aboriginal didgeridoo playing

Usually the drone tone is the tonic note—though not necessarily in the Western diatonic tonal music tradition. Sometimes a single drone tone is not the tonic.

When the drone is the tonic note, it serves the same function as the tonic note in Western diatonic harmony. It acts as the musical centre of gravity, an important unifying role when employed with scales other than diatonic major or minor scales (or close relatives such as pentatonic scales).

A drone sound makes it possible to play modal melodies while providing harmony, because every melodic note *automatically harmonizes* with the drone, except melodic notes identical to the drone. Some are close harmonies (related by simple frequency ratios), others are dissonant harmonies.

6.3 Introduction to Chord Progressions

6.3.1 WHAT ARE CHORD PROGRESSIONS GOOD FOR?

When you hear a tune, you hear a sequence of individual pitches. In the context of tonality, all of those pitches—except scale degree 1—sound restless.

But when you hear a *chord*, you don't hear the individual pitches. Even when you finger-pick chord changes on the guitar, or play the chords as arpeggios on the keyboard, you still don't hear a tune. You hear chords being unrolled and spread out in time. But they still sound like chords—not a melody.

Your brain processes harmony differently from the way it processes melody. That's why there's no "music" in harmony without melody.

When you hear a chord progression *and* a tune simultaneously, your brain processes the chords as blends of related tones, a kind of third dimension of music, unfurling and sprawling beneath and around the tune, a colourful sonic panorama. Musical depth.

Your brain hears melody and harmony as related but *separate* entities. The tune is a restless traveller. The chords provide a dynamic, moving landscape through which the tune travels.

Chord progressions, though not absolutely necessary in the making of music, serve three main functions:

1. Chord progressions help *define tonality* and unify a piece of music. They provide a sonic frame of reference that makes unrest and dissonance possible.

2. Chord progressions impart drive and propulsion to a piece of music. In the context of tonality, most chords, like most intervals in a melody, sound, to a greater or lesser degree, tense and restless. *They seek resolution*. Like the tune itself, they're also trying to find their way home.

3. Chord progressions furnish music with the qualitative aural equivalents of color and depth.

6.3.2
DYNAMIC QUALITIES OF CHORDS

A chord has a unified sound and retains its identity even when inverted. However, the all-important root note of the chord (the lowest note of the chord in root position, not inverted) simultaneously wears another hat, namely, as a degree of a melodic scale.

When the scale degree of a key coincides with the root of a major or minor triad—which only happens when scale degree 1 coincides with the triad built on scale degree 1 (for example, the C major triad in the key of C)—the chord has no dynamic quality, no motion. It's merely a stable triad in root position.

But the moment the tune moves away from scale degree 1, all accompanying chords, whatever they may be, take on a dynamic quality, a feeling of unrest—even major and minor triads. Even the triad built on the tonic note.

How come?

Because all notes in a diatonic scale except scale degree 1 are unbalanced. And when it comes to getting attention, *the tune trumps the chord*.

Repeat:

The tune trumps the chord (see Chapter 9).

As you will learn in Chapter 9, bearing this fact in mind will help you enormously in your songwriting. Your brain zeros in on the *tune*, which, again, is why a chord-free melody stands on its own, but a tune-free chord progression does not.

As long as the tune is in a state of imbalance, no accompanying chord can bring it back into balance.

At the same time, your brain has to be able to identify a succession of notes and accompanying harmony as "music" in the first place. For the collective musical mind of an audience to find a piece of music memorable and emotionally potent ...

- The piece must have enough tonal unity to be coherent;
- It must also possess a sufficient variety of tonal disturbance and tension to be mesmerizing.

Unity and variety. Both are essential. The trick is to have them in the right balance. That means a melody and its chords must necessarily be *tonally related* in some way. What way?

6.3.3 UNDERSTANDING HARMONY: TERMS OF ENDEARMENT

Melody and harmony, while identifiably different, relate to each other so intimately that similar terms are used to describe and understand their individual natures.

Just as melody is organized by *scale degrees*, *intervals*, and *scales*, so harmony is organized by *harmonic degrees, harmonic intervals,* and *harmonic scales* (Table 37 below).

TABLE 37 Basic Terms, Melody vs Harmony

Melodic Terms	Harmonic Terms
Notes are identified as ***scale degrees.*** Each note has an assigned Arabic number, 1, 2, 3, 4, etc., identifying its scale position.	Chords are identified as ***harmonic degrees.*** Each chord has an assigned Roman numeral, I, II, III, IV, etc., identifying the whole chord, although named for the root note.
Note-to-note succession—a tune or melody—proceeds by ***melodic intervals.***	Chord-to-chord succession—a chord progression—proceeds by ***harmonic intervals.***
A diatonic order of seven notes, plus the eighth note which repeats the first at a higher pitch, is called a ***melodic scale*** (major or minor).	The harmonic order of seven chords is called the ***harmonic scale.*** (As you'll soon see, there are 12 harmonic scales.)

Chapters 4 and 5 covered the melodic terms in Table 37 in detail. Now to tackle the harmonic terms, one at a time.

6.4 The Nashville Number System

6.4.1 "HARMONIC DEGREE": JUST A FANCY NAME FOR "CHORD"

In harmony, Roman numerals represent *whole chords*, which are named after their roots. Here's how *scale degree* Arabic numbers and *chord* Roman numerals are related:

- A chord with scale degree 1 as its root is called the I chord (the "one chord"). For example, in the key of C major, the chord C major is the I chord (the "one chord").

- A chord with scale degree 4 as its root is called the IV chord (the "four chord"). For example, in the key of C major, the chord F major is the IV chord (the "four chord"). Etc., etc. So far, so good.

Now for the important part.

The relationship between harmony and melody begins with the identification of the *seven harmonic degrees*. As you'll see in a minute, this is the basis of the *Nashville Number System*.

So ... what's a harmonic degree? Just a technical name for "chord." These chords are the triads (three notes, separated by intervals of a third) whose *roots* are the seven individual scale degrees of a given diatonic scale.

6.4.2 THE SEVEN HARMONIC DEGREES

Have a look at Table 38 below. Each vertical column shows which three notes (scale degrees) form a triad (a chord, or "harmonic degree"), each built on a different note of the diatonic scale:

TABLE 38 The Seven Harmonic Degrees (Also Known As Triads or Chords)

Notes That Comprise Each Chord	The Seven Chords						
5th Note Up From Root (Interval of a third)	5	6	7	1	2	3	4
3rd Note Up From Root (Interval of a third)	3	4	5	6	7	1	2
Root of Triad (Scale Degree)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Chord (Harmonic Degree)	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**

An example is coming up in a minute. For now, bear in mind that each Arabic number represents a *note* of the major scale. So, in the key of C major, for example, 1 = C, 2 = D, 3 = E, etc. Each Roman numeral represents a *chord*. So, for example Roman number I = the *chord* C.

As you study Table 38 with considerable diligence, forsaking even a trip to the Wrong Ranch Saloon for a double Wild Turkey, you will notice that the chords with roots 1, 4, and 5 are shaded lightly, whilst chords with roots 2, 3, and 6 are marked with darker shading. And out there on the right, the chord with root 7 bears the darkest and scariest shading. The reasons for these shading variances will become blindingly clear in a minute.

Also, notice that scale degree 1 (8) is missing. In harmony, unlike melody, scale degree 1 (8) has no meaning because the notes of a chord, including the chord root, apply universally to any and all octaves equally. Again, this will become clearer as you fight your way through this chapter with masochistic but admirable determination.

As you've discovered, chords consist of "third" intervals stacked atop each other. In any diatonic scale, if you select any note as a starting point, you will always get an interval of a third simply by skipping one note of the diatonic scale.

For example, in the key of C major, if you start on the note D and skip to the note F, you get an interval of a minor third (three semitones). If you start on F and skip to A, you get an interval of a major third (four semitones). Remember, even though one interval is a major third and the other is a minor third, both are still considered to be "thirds."

Everywhere along the scale, skipping one note gets you an interval of either a major third or a minor third.

So, any triad will consist of …

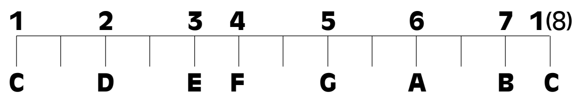
- A *root* note, which can be any note of the scale, plus
- The *third* note up from the root (skipping over the second note), plus
- The *fifth* note up from the root (skipping over the fourth note).

6.4.3 AN EXAMPLE: THE SEVEN HARMONIC DEGREES IN THE KEY OF C MAJOR/A MINOR

Using the key of C major as an example, you can find out exactly which chords are this key's seven "harmonic degrees" (just a fancy name for "chords"), and which notes make up those chords.

To start, here's the scale you're dealing with (Figure 43):

FIGURE 43 C Major Scale



And here are the seven harmonic degrees (chords) in the key of C major, showing which three notes comprise each triad (Table 39 below):

TABLE 39 The Seven Harmonic Degrees (Triads or Chords) in the Key of C Major / A Minor

Notes In Each Chord	Names of the Seven Chords						
	C Major	**D Minor**	**E Minor**	**F Major**	**G Major**	**A Minor**	**B Dim.**
5th Note	G	A	B	C	D	E	F
3rd Note	E	F	G	A	B	C	D
1st (Root)	**C**	**D**	**E**	**F**	**G**	**A**	**B**
Chord (Harmonic Degree)	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**

Why "C Major/A Minor" in the title of Table 39? Because in harmony, the major and relative minor keys are so intimately related that they share the same "harmonic scale," sometimes called the *scale of harmonic degrees*, as you'll see shortly.

You'll note that, of the seven triads in Table 39 above:

- Three are major triads (major chords)
- Three are minor triads (minor chords)
- One is a diminished triad (diminished chord)

For example, the notes that make up the chord with root C consist of an interval of a major third (C – E) on the bottom and a minor third on top (E – G). So it's a major triad (C, E, G).

The notes that make up the chord with root D consist of a an interval of a minor third (D – F) on the bottom and a major third on top (F – A). So it's a minor triad (D, F, A). And so on.

Now it's becoming clearer how chords add a "third dimension," a sense of depth and color to music.

Speaking of color, in Table 39 above, shading identifies the chord types. The major triads are lightly shaded, the minor triads medium-shaded, and the diminished triad darkly shaded.

One of the first things you've probably noticed about the chords that make up the seven harmonic degrees is that three of them, the three major chords, C major, F Major, and G major, are the same three chords you find in 87 gazillion popular

songs. The famous "three basic chords" that everybody learns to play on the guitar pretty soon after first picking up the instrument. (And, for a lot of guitar pickers, the only chords they ever learn.)

- These three chords, C, F, and G, happen to collectively contain all seven notes of the C major scale and its relative minor, the A natural minor scale.

- Same goes for the three minor chords—they also collectively contain all seven notes of the A natural minor scale and its relative major, the C major scale.

6.4.4 THE NASHVILLE NUMBER SYSTEM OF CHORD NOTATION: WHY IT'S IMPORTANT AND HOW IT WORKS

A lot of session players in Nashville do not read music. So they use a system of chord notation that originated in Europe in the eighteenth and nineteenth centuries. Starting in the 1950s, Nashville players began adapting it for their own needs. Now everybody knows it as the *Nashville Number System*.

The Nashville Number System is "chord shorthand" based on the chords of the seven harmonic degrees (Tables 38 and 39 above). The Nashville Number System makes it possible for any player to play the correct chords of a song in any key, simply by numbering the chords according to their harmonic degrees.

The advantage?

Once a lead or lyric sheet is notated using the Nashville Number System, performers can use it to play or sing the song in *any key*. Players do not have to re-notate lead sheets every time someone decides to try out the tune in a different key. Which happens an awful lot.

The Nashville Number System works like this:

- Each chord of the seven harmonic degrees (Tables 38 and 39 above) gets notated on the lead sheet according to the *number* of the chord's root.

- You can (and should) use *Roman numerals* to represent the chords, but in Nashville they usually use Arabic numbers (which is a bit confusing, since Arabic numbers apply to scale notes as well).

- For the minor triads, add a lower case "m" to the number.

- For the diminished chord, add the symbol "°". Add other symbols as needed for different extensions of chords such as ninths.

Table 40 below shows the Nashville Numbers for all seven harmonic degrees.

TABLE 40 The Seven Harmonic Degrees (Triads or Chords): The Nashville Number System

	Harmonic Degrees (Chords)						
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**
Nashville Number	1	2m	3m	4	5	6m	7°
What They Call It	the "one" chord	the "two" chord	the "three" chord	the "four" chord	the "five" chord	the "six" chord	the "seven" chord
Chord is Always...	major	minor	minor	major	major	minor	dimin-ished

Now, the above chart is not exactly right. In Nashville, all Nashville Numbers are considered to be *major chords unless you specify otherwise.*

So, for example, if you say, "Play the two chord," the Nashville session player will play the two *major* chord unless you say, "Play the two minor chord."

If you say, "Play the seven chord," the session player will play the seven *major* chord unless you say "Play the seven diminished chord," or "Play the seven minor sixth chord," or "When can we take a break and grab a beer?"

In the remaining discussion of harmony, the Nashville Number System applies. However, only *Roman numerals* are used for chords, not Arabic numbers. For example, the Nashville Number of the "seventh" of the chord built on scale degree 5 is notated as V7 (instead of 5 - 7).

When referencing a specific key, such as the key of C, alphabetic letters replace Roman numerals to identify chords. Like so (Table 41):

TABLE 41 The Seven Harmonic Degrees: Modified Nashville Number System

Harmonic Degree	I	II	III	IV	V	VI	VII
Modified Nashville Number	**I**	**IIm**	**IIIm**	**IV**	**V**	**VIm**	**VII°**
Example: Chords in Key of C/Am	C	Dm	Em	F	G	Am	B°

One other thing: It's standard in "normal" chord notation to:

- Capitalize the letter of the root chord ("A" for A major, instead of "a")
- Use a capital "M" for a chord with a major seventh interval, as AM7 (A major seventh)
- Use a lower case "m" for a chord based on a minor triad, as Am7 (A minor seventh)

When using Nashville Numbers, *always capitalize the equivalent Roman numerals.*

For example, in the Nashville Number System, the chord Am7 in the key of C major/A minor becomes "VIm7" ("six minor seventh" or "the minor seventh of the six chord") in the Nashville Number System. The chord AM7 in the key of C major/A minor becomes VIM7 ("six major seventh" or "the major seventh of the six chord").

Some people use lower case Roman numerals to signify "minor". That is, vi = minor and VI = major. For instance, they'll write in an e-mail to a friend: "yesterday I was working on a chord progression in the key of c and I was playing a vi chord ..."

Now, would that be the chord A minor or the chord A major?

Don't do this. Do not use lower-case Roman numerals, *ever*. It only breeds confusion.

Always use CAPITAL Roman numerals when using Nashville Numbers.

Note, however, that there's no "world standard" on this issue, as there is, for example, in tuning musical instruments, where "Concert A=440 Hz" is the

recognized world standard. So if you insist on using lower case Roman numerals for minor chords, Marshal McDillon will not arrest you. But you might get confused.

THE OLDEST JORDANAIRE

Neal Matthews is credited with devising the Nashville Number System. For some 47 years, until his death in 2000, Matthews sang tenor as a member of The Jordanaires, who gained international fame as background vocalists for Elvis Presley, Jerry Lee Lewis, Patsy Cline, Marty Robbins, Johnny Cash, George Jones, Roy Orbison, Willie Nelson, Dolly Parton, Neil Young, and hundreds of other great songwriters and performers.

The Jordanaires are still performing today. The oldest Jordanaire, the legendary counter-tenor Little Willy Jim Bob Peabody, cut his first record in 1886, at the dawn of the age of wax cylinder recordings.

In 2006, Peabody celebrated his 120th year in show business with a backing vocal performance on Celine Dion's cover recording of the Metallica classic, "So What." Dion's husband and manager, Rene Angelil, had to hire extra security for the recording session to keep the frisky 143-year-old Jordanaire charmer at a respectable distance from Dion, who enjoyed all the attention, as she often complains she doesn't get enough. Attention.

6.5 The Four Types of Chord Progressions

6.5.1 "HARMONIC INTERVAL": JUST A FANCY NAME FOR *CHORD CHANGE* OR *CHORD PROGRESSION*

The term *interval* has a considerably different meaning in harmony, compared with melody. Simply put, a *harmonic interval* is a chord change.

A succession of melodic intervals is represented like this:

1 – 4 – 2 – 5 – 1

Each symbol represents a single note, called a scale degree. Each dash represents a *pitch change* from one single note to another single note.

So far, such pitch changes have been referred to as "intervals." From now on, they're *melodic intervals*, so as to distinguish them from *harmonic intervals* (chord changes). So, in the above example, there are five notes and four melodic intervals.

A succession of *harmonic intervals* (chord changes) is represented like this:

I – VIm – IIm – V7 – I

Each symbol represents a harmonic degree, commonly known as a chord. Each dash represents a harmonic change, from one chord to another chord.

Such harmonic changes are called *harmonic intervals*, or *chord changes*, or *chord progressions*. All of these terms mean the same thing. In the above example, there are five chords and four chord changes or harmonic intervals.

6.5.2 HOW CHORDS ACTUALLY CHANGE

When you play your guitar or keyboard and change chords, you do not necessarily go from one chord in its root position to another chord in its root position. Instead, you typically switch among roots and various inversions.

Figure 44 below shows a typical chord progression, G – C – F.

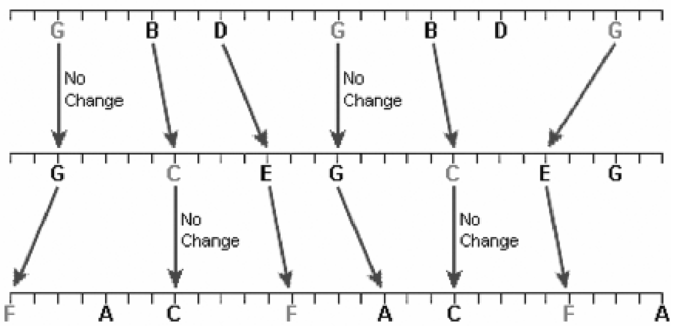
- The top line shows the notes of the chord G major.
- The middle line shows the notes of the chord C major.
- The bottom line shows the notes of the chord F major.

The arrows show which notes of one chord are changing to which notes to form the next chord. The dark letters show the chord roots.

- Some chords have the same note in common. So there's no change in these notes when the chords change.

- The first and last chords (G major and F major) are in root position (their root notes are furthest to the left) while the middle chord (C major) is a second inversion chord (the note G is in root position).

FIGURE 44 Typical Chord Changes: G Major (Root Position) to C Major (2nd Inversion) to F Major (Root Position)



So, a chord progression (such as the one above) is a movement of chords *in their entirety*, not merely a movement of notes, or chord roots, or specific inversions.

In fact, there's no such thing as movement of "chord roots."

In harmony, chord-to-chord movement is of an entirely different sort, compared with melodic note-to-note movement. It sounds different, it feels different, it *is* different.

As the chord changes from G major (top line in Figure 44) to C major (middle line) to F major (bottom line), it's clear that the overall sound of the chord changes have *nothing to do with rising or falling pitch*.

As the chords change, the notes within the chords don't move much in pitch. In four cases, the notes remain in exactly the same position as the chord changes. In most of the other eight cases, the pitch change from chord to chord is only a semitone or a tone—*up*, in some cases, *down* in others.

What your brain hears as the chords change in sequence are changes in musical "color," not rising or falling pitch.

6.5.3 THE TRICKY BUSINESS OF NAMING HARMONIC INTERVALS (CHORD PROGRESSIONS)

Melodic intervals have logical, straightforward names (more or less). A perfect fourth is the interval between the tonic note and the fourth note of the diatonic scale. A perfect fifth is the interval between the tonic note and the fifth note of the diatonic scale.

Naming harmonic intervals (chords) is not so straightforward. Chord movements are named according to the intervals between their roots, even though root movement has no meaning by itself.

It's the *whole chord that moves*, regardless of root or inversion. The chord is simply named after the root.

The tricky thing here is that the name of the interval between chord roots can have two meanings:

1. It can refer to the movement of a given chord "up" to the next chord in the progression, with respect to the root name—for example, C "up" to G if you go like this: C, D, E, F, G.

2. It can refer to the movement of a given chord "down" to the next chord from the original chord, with respect to the root name—for example, G "down" to C if you go like this: C, B, A, G.

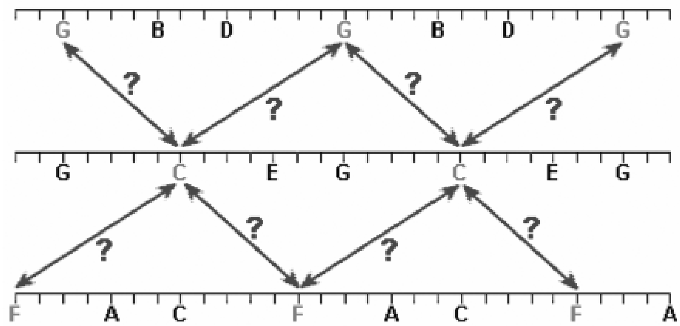
Either way you figure it, you're still changing from a "C" chord to a "G" chord. But the *order* of the chords in the progression matters with respect to naming. The chord change from C to G has a different name, *and a different musical effect*, compared with the chord change G to C.

6.5.4
FIFTH PROGRESSIONS, UP AND DOWN

As noted, harmonic intervals (chord changes) are named after their *roots*.
In Figure 45 below, you can see the dilemma. The root is just one of several notes in a chord. So how do you name these harmonic intervals?

- When you change from the chord G major to the chord C major, is that an interval of a fourth or a fifth?
- Is it going "up" or "down"?
- When you change from the chord C major to the chord G major, is that an interval of a fourth or a fifth?
- Is it going "up" or "down"?

FIGURE 45 Dilemma: How to Name These Harmonic Intervals (Chord Changes)



Since root movement by itself has no meaning in harmony, movement "up" or "down" from one chord to another chord amounts to exactly the same thing, with respect to root movement.

Recall the discussion of *complementary intervals* from Chapter 4. Any two intervals that add up to an octave are called complementary intervals. In harmony, complementary *harmonic* intervals have the same names, as you'll see in a minute.

The harmonic interval (chord change) G – C spans the same harmonic distance as the harmonic interval (chord change) C – G. That's pretty obvious: when you play the chords C – G – C – G – C – G, you're just playing the same two chords alternately.

This is different from melody, because in melody, the octave matters. In melody, the interval C – G is a perfect fifth (with C as the lower pitch), but the interval G – C is a perfect fourth (with G as the lower pitch). So you hear two *different* melodic intervals:

C – G
G – C

or the ascending melodic sequence:

C – G – C

where the second C is an octave above the first C. Two distinct melodic intervals, three distinct pitches.

Not so in harmony.

You hear only one harmonic interval when you play the chords:

C – G
G – C

And when you play the harmonic sequence (chord progression):

C – G – C

you hear only *two* chords. The second C chord is exactly the same chord as the first C chord. The octave in which you play these chords does not matter. The two chords are both still either C major or G major chords.

And yet, despite the single harmonic interval, *there is an important distinction between these two chord sequences:*

C – G
G – C

In harmony, the distinction is that C – G is considered a harmonic movement "up" because you get to the *root note* of the next chord by going "forward" alphabetically from the root note of the first chord to the root note of the next one in the progression. Like this: C – D – E – F – G.

The progression G – C is considered a harmonic movement "down" because you get to the root note of the next chord by going "backward" alphabetically, from the root note of the first chord to the root note of the next one in the progression. Like this: G – F – E – D – C.

Unlike in melody, the harmonic terms "up" and "down" with respect to interval movements (chord changes) *have nothing whatsoever to do with pitch change.* Unlike in melody, the chord change G – C does not mean that the chord C is "higher" or "lower" in pitch than the chord G.

CHORD SICKNESS AND BARFING AUDIENCES

Suppose you have $20 million burning a hole in your jeans. That's what it costs to visit a space station as a tourist. (NASA is ready to take your order. Operators are standing by.)

Once you're up there, the space station orbits in a certain direction. But inside the spacecraft, your body floats all over the place. You do not perceive your motion to be "up" or "down." There's no "up" or "down" in space. So you get space sickness and you barf. And your fellow astronauts move away from you and mutter to each other about how disgusting you are.

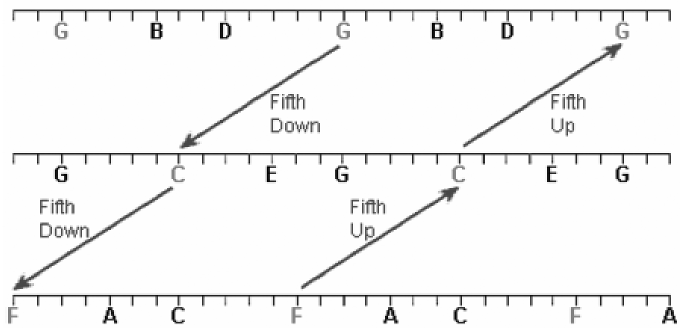
That's how chord progressions work. Chords move, and, under certain circumstances, they move in a perceived direction. But they do not move "up" or "down," the way melody does. There's no "up" or "down" in harmony. So, if you don't know what you're doing when you create a chord progression, your listeners may get chord sickness and barf.

In harmony, both chord changes—the chord C moving to the chord G (thought of as going "up," which means counting forward from the first chord: C, D, E, F, G), and the chord G moving to the chord C (thought of as going "down," which means counting backward from the first chord to the next one in the progression: G, F, E, D, C), are called, by convention, *fifth progressions*. Even though, in terms of *melodic scale degrees*, G – C is a fourth.

So, unlike the situation with melodic intervals, you never refer to a chord change such as G – C as a harmonic interval of a fourth (a "fourth progression"). No such thing.

Figure 46 shows an example of how fifth progressions get their names. The chord change is from G major in root position (top line) to C major, second inversion (middle line) to F major in root position (bottom line), or the reverse, from F to C to G. Although all the notes change simultaneously as you move from line to line, the arrows show only the chord roots (after which the chords are named).

FIGURE 46 Fifth Progressions, Up and Down



To summarize:

1. If you go from the top line to the bottom line, the chords change from G major to C major to F major. These are called fifth progressions, *down* (counting *backward* from the first chord root to the next one in the progression).

   This is a *fifth down* chord progression:

   G – C – F

2. If you go from the bottom line to the top line, the chords change from F major to C major to G major. These are fifth progressions, *up* (counting forward from the first chord root to the next one).

   This is a *fifth up* chord progression:

   F – C – G

When you play these two chord progressions, they sound quite different from each other. That is, a *fifth down* progression has a *different harmonic character* from a *fifth up* progression. Even though both progressions consist of exactly the same three chords. Even though the notes within each chord are identical.

The *sequence of the chords* matters. That's what gives each type of progression its own distinctive character.

It's worth repeating that the terms "fifth up" and "fifth down" *do not imply pitch change*. The terms "up" and "down" are simply unfortunate quirks of nomenclature.

- "Up" means counting *forward in letter-sequence order* to arrive at the *name* of the next chord in the sequence (which is named for its root).

- "Down" means counting *backward in letter-sequence order* to arrive at the name of the next chord (which is named for its root).

Pitch is the "height" dimension of sound, so "up" and "down" make sense. Harmony is the "depth" and "color" dimension of sound, so using the terms "up" and "down" do not make sense. However, we're stuck with the "up" and "down" nomenclature with respect to chord progressions, even though it's completely misleading.

If you get confused about how chord progressions are named, just remember that **"up"** in chord progression terms means **counting forward** from the first chord-root name to the next one, and **"down"** means **counting backward** from the first chord-root name to the next one. (*Nothing whatsoever to do with "up" in pitch or "down" in pitch.*) Here are a few examples:

Count the *fifth up*, A – E , by reading *forward:* **A** > B > C > D > **E**
Count the *fifth down*, E – A , by reading *backward:* **A** < B < C < D < **E**
Count the *fifth up*, D – A , by reading *forward:* **D** > E > F > G > **A**
Count the *fifth down*, A – D, by reading *backward:* **D** < E < F < G < **A**

6.5.5 THIRD PROGRESSIONS, UP AND DOWN

Just as harmonic progressions with roots a fifth or a fourth apart span the same harmonic space, so harmonic progressions with roots either a third (e.g., Am – C) or sixth (C – Am) apart span the same harmonic space.

By convention, these are both called *third progressions*. And again, unlike the situation with melodic intervals, by convention, there's no such thing as a harmonic interval called a sixth (a "sixth progression").

- A *third progression up* means counting forward by letter-name from the first chord root to the next one in the progression. So Am – C is a third progression up.

- A *third progression down* means counting backward by letter-name from the first chord root to the next one in the progression. So C – Am is a third progression down.

Even though the same two chords are used, the *sequence* of chords matters. The progression Am – C sounds different from the progression C – Am. Just as a fifth progression *up* sounds different from a fifth progression *down*, so a third progression *up* sounds different from a third progression *down*.

6.5.6 SECOND PROGRESSIONS, UP AND DOWN

Harmonic movements with roots either a second (e.g., C – Dm) or seventh (Dm – C) apart span the same harmonic space, because there's no "up" and "down" in harmonic space, the way there is in melodic space (high pitch vs low pitch).

By convention, they're both called *second progressions*. There's no such thing as a harmonic interval called a seventh (a "seventh progression").

- A *second progression up* means counting forward by letter name from the first chord to the next one in the progression. So C – Dm is a second progression up.

- A *second progression down* means counting backward from the first chord in the progression. So Dm – C is a second progression down.

6.5.7 CHROMATIC PROGRESSIONS

Diatonic harmonic intervals for a given key can only arise from triads built on roots belonging to the diatonic scale.

Why is this?

- The tonic note of a scale contains overtones that strongly reinforce scale degrees 1, 3 and 5. (Music always gets back to the brain recognizing simple-ratio overtones.)

- This in turn gives rise to the triad built on the tonic note, consisting of scale degrees 1, 3, and 5 of the diatonic scale, the overtones of which all reinforce each other internally.

- This gives rise to triads built on the other six notes of the diatonic scale.

- This provides a basic vocabulary of seven triads (three major, three minor, one diminished) in any given key, each with root-third-fifth structure and overtones all reinforcing each other.

- The brain interprets and processes all of these simultaneously-sounding tones with reinforcing overtones as the sonic delight, harmony.

However, chords can also progress by *non*-diatonic intervals—intervals whose roots are not in the diatonic scale of the prevailing key. Such chord changes are called *chromatic progressions*.

For example, in the key of C major, you would call the progression from the chord C major to the chord to E♭ major a chromatic progression.

Why not call this a third progression? After all, the root moves three semitones, just like the chord progression C – Am, a third progression. Why call C – E♭ a chromatic progression instead of a third progression?

Because in harmony, all three of the notes that make up each triad *must belong to the diatonic scale* for the prevailing key. Otherwise, there's no tone/overtone acoustic resonance. Your brain simply does not recognize the chord as belonging to the prevailing key. The chord E♭ is therefore chromatic.

The chord E♭ major consists of the notes E♭, G, and B♭. If the prevailing key is C major, your brain does not recognize the chord E♭ major, with its chromatic notes E♭ and B♭, as belonging to the prevailing key.

Since chromatic chords have roots *outside of the key's scale notes*, harmonic movement "up"or "down" (such as a "fifth up" or a "third down") does not apply to chromatic chords. Instead, chromatic chord movement is defined as:

- *Exiting* the prevailing key when the progression moves from a chord within the key to a chromatic chord, and

- *Returning* to the prevailing key when the progression moves from the chromatic chord back to the key.

6.5.8 SUMMARY AND EXAMPLES OF THE FOUR TYPES OF CHORD PROGRESSIONS

Table 42 summarizes the only four harmonic interval (chord progression) types:

- Seconds (up or down),
- Thirds (up or down),
- Fifths (up or down),
- Chromatic (exiting or returning).

Keep in mind that the intervals in the "Examples" column are *chord movements*, not single note movements.

TABLE 42 The Four Types of Harmonic Intervals (Chord Progressions)

Root Movement	A Few Examples: Key of C / Am	Progression Name
SECOND PROGRESSIONS		
I – II	C – Dm	Second progression, up
II – I	Dm – C	Second progression, down
VII – I	B° – C	Second progression, up
I – VII	C – B°	Second progression, down
THIRD PROGRESSIONS		
I – III	C – Em	Third progression, up
III – I	Em – C	Third progression, down
VI – I	Am – C	Third progression, up
I – VI	C – Am	Third progression, down
FIFTH PROGRESSIONS		
I – V	C – G	Fifth progression, up
V – I	G – C	Fifth progression, down
IV – I	F – C	Fifth progression, up
I – IV	C – F	Fifth progression, down

CHROMATIC PROGRESSIONS		
I – ♭II	C – D♭	Chromatic progression, exiting
♭II – I	D♭ – C	Chromatic progression, returning
I – ♭III	C – E♭	Chromatic progression, exiting
♭III – I	E♭ – C	Chromatic progression, returning
I – ♯IV	C – F♯	Chromatic progression, exiting
♯IV – I	F♯ – C	Chromatic progression, returning
I – ♭VI	C – A♭	Chromatic progression, exiting
♭VI – I	A♭ – C	Chromatic progression, returning
I – ♭VII	C – B♭	Chromatic progression, exiting
♭VII – I	B♭ – C	Chromatic progression, returning

IMPORTANT: In Table 42, the chord progressions in the "Examples" column represent only a smattering of the possibilities in the key of C / Am. What's missing? Well, for example, the chord change Dm – G is a fifth progression down. So is Am – Dm. And the chord change F – B♭ in the key of C / Am is a chromatic progression, exiting. So is Dm – E♭.

EVEN MORE IMPORTANT: *You don't have to remember or memorize all that stuff in Table 42.* Why? Because, in a while, you'll learn a *visual* way of making sense of chord progressions. A way to sketch a "map" of a song's chord progressions.

All of this will begin to make much more sense shortly. Next up: the harmonic equivalent of the melodic scales you studied so conscientiously in Chapter 4. You're ready to learn all about *harmonic scales*.

6.6
Scales of *Chords*? Yes!

6.6.1
THE KEY TO BOLDLY GOING WAY BEYOND THE "THREE-CHORD WONDER"

Usually, you think of a scale as an ordered sequence of single notes. Chapter 4 was all about identifying melodic intervals, scale degrees, and the organization of melodic scales.

Does the same apply to harmony? That is, having identified the various harmonic degrees (chords) and harmonic intervals (chord changes, also called chord progressions), can they be organized into harmonic scales—harmonic equivalents of melodic scales?

And if so, does that mean there's a guaranteed way to write a chord progression that holds together? Sounds like it "knows where it's going"?

The answer is yes.

Few songwriters know about it, though.

The harmonic equivalent of a melodic scale is called a *harmonic scale*, or scale of harmonic degrees. It's a powerful musical phenomenon. You're about to learn to make creative use of it.

There are 12 such harmonic scales, one for each pair of relative keys—major and relative minor (or vice versa).

In the following sections, you'll learn how easy it is to create chord progressions that sound "different" from your run-of-the-mill "three-chord wonders." And yet natural and attractive to the ear.

True, many great songs have only three basic chords. But the same three basic chords also show up in zillions more awful songs.

Tune and lyrics notwithstanding, most songwriters simply don't know how to create beautiful chord progressions because they have zero knowledge of harmonic scales and how to use them. Once you understand how easy it is to use harmonic scales, you won't ever have to worry about writing lame chord progressions again.

6.6.2
UNREST AND DIRECTION: THE MAGIC OF V – I

Recall from Chapter 4 that, in melodic scales, two scale degrees (notes of the scale) "point" strongly towards scale degree 1, namely, its two neighbours, scale degree 2 (from above) and scale degree 7 (from below). Scale degrees 2 and 7 have both *unrest* and *direction*.

For example, in this scale:

C – D – E – F – G – A – B – C

the note D strongly seeks resolution (unrest) down (direction) to C, and B strongly seeks resolution (unrest) up (direction) to C.

Unrest and direction.

In harmony a parallel situation obtains. But in harmony, only one harmonic degree, or chord, "points" strongly towards harmonic degree I, not two chords.

The *only chord in harmony* that has both *unrest* and *direction* is harmonic degree V ("the five chord").

1. As Table 43 below shows, the notes comprising harmonic degree V include scale degree 7 and scale degree 2. Both of these notes point strongly to the tonic note of the key, scale degree 1.

TABLE 43 Notes Comprising Harmonic Degree V ("The Five Chord," As They Say In Nashville)

5th Note Up From Root (Interval of a third)	5	6	7	1	2	3	4
3rd Note Up From Root (Interval of a third)	3	4	5	6	7	1	2
Root of Triad (Scale Degree)	**1**	**2**	**3**	**4**	**5**	**6**	**7**

2. Recall from Chapter 5 that the more scale notes two keys have in common, the more closely they're related. And keys having tonic notes a fifth apart have six out of seven scale notes in common. (For example, the key of C major and the key of G major have 6 of 7 scale notes in common.)

3. The simplest frequency ratio after the octave (1:2) is the ratio that corresponds to the fifth (2:3).

For all of these reasons, the harmonic interval (chord change or chord progression) V – I plays the same role in harmony as do melodic intervals 7 – 1 and 2 – 1 in melody.

The V – I chord change is the strongest, most natural chord progression in harmony.

Just as melodic intervals 7 – 1 and 2 – 1 impart both unrest and direction with respect to the tonic note, so the harmonic interval V – I imparts both unrest and direction with respect to the tonic chord—the chord built on scale degree 1.

6.6.3 HARMONIC "SCALE NEIGHBOURS"

Just as scale degrees 7 and 2 are scale neighbours of the tonic note in melody, so in harmony the V chord is the scale neighbour of the tonic chord.

And that means the chord change V – I is the *smallest scale move* you can make in harmony. The V chord and the I chord are, therefore, *harmonic scale neighbours*.

This is *precisely the opposite* of the situation in melody.

For example, in the key of C major:

- Melodically, the notes B and C are close together. They're melodic scale neighbours. The notes C and G are as far apart as you can get—definitely not melodic scale neighbours.

- Harmonically, the chords C major and G major are close together. They're harmonic scale neighbours. But the chords C major and B major are far apart—definitely not harmonic scale neighbours.

WANTED: MUSICAL MARRIAGE COUNSELLOR

Think of harmony and melody as opposite sexes.

In melody, the fifth is the *furthest* note from the tonic. But in harmony, the fifth is the *closest* chord to the tonic.

Opposites in a fundamental way.

When they're together, harmony and melody usually get along. Sometimes they fight. Paradoxically, such fighting often sounds delightful.

When they divorce, melody functions fairly well on its own. But harmony does not. By itself, poor harmony flounders, and must find a way to reconcile with melody.

6.6.4
THE HARMONIC SCALE: WILL THE CIRCLE BE UNBROKEN?

To construct a harmonic scale (scale of chords), here are the chords to start with, the basic chords for any given key (in Nashville Number notation):

I IIm IIIm IV V VIm VII°

The next step is to arrange these chords with each chord the smallest distance apart harmonically (just as, in a melodic scale, the notes are the smallest distance apart as you go up or down the scale stepwise, from note to note). That means the root of each chord would be a fifth apart, since, in harmony, a *fifth progression* is the smallest harmonic distance.

A major difference between a melodic scale and a harmonic scale would be this:

- A melodic scale begins with scale degree 1 and ends with scale degree 1 (8)—*two different notes*. That's because, in melody, the octave matters.

- In harmony, *the octave does not matter*. Therefore, a harmonic scale would need to begin with harmonic degree I and also end with harmonic degree I—the *same chord*. As pointed out above, a chord is a chord is a chord. No distinction is made between a chord played in one octave and the same chord played in a different octave.

Since the first and last chords in the harmonic scale are the same chord (the tonic chord, I), what shape, then, must a harmonic scale take?

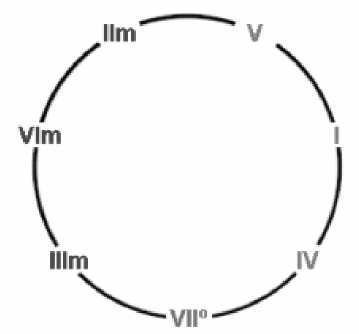
If a harmonic scale must begin and end with the same chord ...

The harmonic scale must necessarily take the shape of a *circle*.

That's the only way the harmonic scale could begin and end with the same chord.

Figure 47 shows how the chords of a harmonic scale are arranged in fifth progressions, and in the shape of a circle.

FIGURE 47 The Harmonic Scale: Basic Structure



6.6.5 FAMILIES WITHIN THE CIRCLE

The first thing you notice about the chords in Figure 47 above is that they clump together. The major chords form a little family of three on the right side of the harmonic scale. The minor chords form another little family of three on the left side. (Isn't that sweet?)

The diminished chord (VII°)—no doubt trained as an expert in family group dynamics and conflict resolution—appears to bridge the two families.

The next thing you might notice is that all but one of the intervals between the *roots* of the chords is five semitones apart (a fifth progression down, going clockwise; a fifth progression up, going counterclockwise). The exception is the interval between the root of the IV chord and the root of the VII° chord (six semitones).

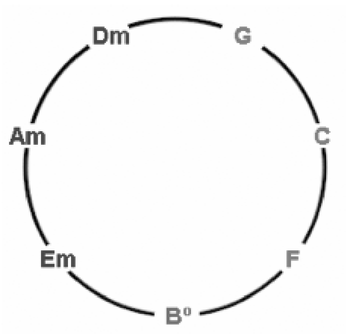
Later in this chapter, you'll see how this little anomaly helps explain why composers have a hard time working with the Church modes (Dorian, Phrygian, Lydian, Mixolydian, Locrian) when it comes to constructing palatable-sounding chord progressions.

6.6.6
WHICH DIRECTION HOME?

How does it feel
How does it feel
To be on your own
With no direction home
—BOB DYLAN ("Like A Rolling Stone")

Next, try an example. Replace the Nashville Numbers with the chords of a representative key—actually a pair of relative keys— and try out the harmonic scale. Use the keys of C major and A minor (Figure 48):

FIGURE 48 Harmonic Scale, Key of C Major / A Minor



So far, so good. But this harmonic scale needs some tweaking.

If you play the harmonic scale clockwise, starting from C major and ending with C major, your brain senses natural, directed harmonic motion. The progression is definitely "going somewhere."

It pulls out of Dodge City (the C major chord) and moves smoothly to Fowler (the F major chord). It feels like you're on your way to somewhere. The sense of motion continues as the harmonic train moves from town to town on a grand circle tour. Tyrone, Richfield, Johnson City, Garden City, Cimarron. Finally, it pulls into Dodge City once more. With that last harmonic interval (G – C), there's no mistaking the feeling of arriving back home.

Now, try going the other way around, from the chord C major to G major to D minor, and so on. You'll soon find that something's amiss. When you try to take the grand circle tour counterclockwise, your train gets lost and ends up somewhere

between Moose Jaw, Saskatchewan, and Dildo, Newfoundland (yes, such towns exist).

Even though you eventually arrive back home, your brain does not sense that your train has arrived home. It's Dodge, seemingly. But nobody's around that you'd recognize. Where's Marshall McDillon? How come Doc Yada-Yadams is sober and hardly ever performs brain surgery? Since when did Ms Puma start playing the flute? How come Sadie and Ellie Sue's store is full of mules instead of horses?

In a minute, you'll find out what went wrong in the counter-clockwise trip. But first, a brief revisit to the interval dynamics of the melodic scale.

6.6.7 THE MELODIC SCALE: TWO DIRECTIONS HOME

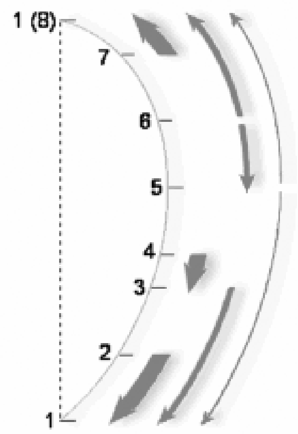
In melody, as you move up the scale, from scale degree 1 to 2 to 3, and so on, your brain senses a feeling of "going away"—paddling against the current— until you reach scale degree 5.

Then, as you continue in the same direction (away from scale degree 1), you sense that the current reverses itself. And you find yourself somehow paddling with the current, even though you haven't turned around.

It's the *current* that reverses, not you. The current even carries you home. But it's not the same home you left. Instead of "home" being scale degree 1, it's scale degree 1 (8). Yet your brain still perceives 1 (8) as "home." That's the important thing (Figure 49 below).

Your brain has evolved to expect complex frequency ratios to resolve to simpler frequency ratios. And what's the simplest? The tonic note of the octave: scale degree 1, or scale degree 1 (8).

FIGURE 49 Melodic Scale: Two Directions Home



This also happens when you move down the melodic scale, from scale degree 1 (8) to 7 to 6. Again, your brain senses that you're padding against the current. Until you reach scale degree 5. Then you sense reversal of the current and paddle downstream until you get home to scale degree 1.

So, in melody, you can get home by either ascending or descending the melodic scale. The most powerful forces for resolution are the melodic intervals 7 – 1 (8) and 2 – I.

In melody, there are two directions home.

In harmony ... maybe not.

6.6.8 HOW DOES IT FEEL TO MOVE CLOCKWISE ROUND THE HARMONIC SCALE?

Have another look at Figure 48 above, (key of C major/A minor). Suppose you start at the C major chord. To stay within the circle, you have two choices:

1. You can progress clockwise to F major; or
2. You can progress counterclockwise to G major.

Suppose you start by playing four bars of the C major chord on your guitar or piano to establish tonality. Then progress clockwise to the F major chord and play a few bars. How does it feel?

Your brain senses a purposeful, natural harmonic move. A feeling of moving ahead, of going somewhere.

It doesn't matter if you start by playing the C major chord in a high octave, then move to the F major chord in a lower octave, or vice-versa. Either way, you sense a purposeful, natural, comfortable harmonic progression.

How come?

When you progress from C major to F major, you move from these notes

C – E – G

to these notes:

F – A – C

When you leave the C major chord and move to the F major chord, your brain wonders, "What's going on? The chord has changed. Looks like the new chord is assuming the role of the tonic chord—at least for the moment."

Therefore ...

1. The scale relationship of the note E in the C major chord (the chord being left behind) with respect to the root note F (the foundation note) in the new chord, F major, is 7 – 1 (8).

   Your brain feels a strong sense of satisfaction when the note E in the C major chord resolves to the root note F in the new chord, F major.

2. Similarly, the scale relationship of the note G in the C major chord (the chord being left behind) with respect to the root note F in the new chord, F major, is 2 – 1.

   Your brain feels a strong sense of satisfaction when the note G in the C major chord resolves to the root note F in the new chord, F major.

These two simultaneous moves—E moving up to F (7 – 1) and G moving down to F (2 – 1) combine to provide your brain with a feeling of assured, inevitable harmonic motion.

Resolution from complex to simple frequency ratios has taken place.

6.6.9 HOW DOES IT FEEL TO MOVE COUNTERCLOCKWISE? (HINT: THE CAT WANTS BACK IN)

What happens when you go the other way around the circle?

Again, start by playing four bars of the C major chord to establish tonality. Then progress counterclockwise to the G major chord and play a few bars. How does it feel?

Your brain senses a desire to get right back to C major. It's like opening the door to let Tritone the cat outside. A minute later, the cat wants back in.

What's going on?

When you progress from C major to G major, you move from these notes (the notes that comprise the C major chord):

C – E – G

to these notes:

G – B – D

When you leave the chord C major and move to the chord G major, your brain at first tries to accept the G major chord as assuming the role of the tonic chord.

But it doesn't work out. Your brain feels no sense of purposeful, forward motion.

When you leave the C major chord and move to the G major chord, your brain senses that:

1. The scale relationship of the note E in the C major chord (the chord being left behind) with respect to the root note G in the new chord, G major, is 6 – 1.

   This does not in any way reinforce G as a potential new tonal centre.

2. Similarly, the scale relationship of the note C in the C major chord (the chord being left behind) with respect to the root note G in the new chord, G major, is 4 – 1.

   With this interval move, your brain senses no reinforcement of G as a potential new tonal centre.

If the new chord, G major, is supposed to be the new tonic, how did the old chord, C major, yield its power as tonal centre?

The answer is, C major *did not* yield its power.

The notes C and E in the C major chord do not provide any significant propulsion to resolve to the root note G in the new chord, G major.

In fact, when you progress from C major to G major, your brain senses exactly the *opposite* of "harmonic resolution." It correctly senses that the chord change from C major to G major has *created harmonic tension*—not resolved it.

How does it feel? It feels unstable, restless. Your brain expects resolution *back to the C major chord*. (The cat wants back in.)

If you then do exactly that, progress from the G major chord back to the C major chord, the same interval dynamics apply as if you were progressing from C major to F major. When you move from G major to C major ...

1. The scale relationship of the note B in the G major chord (the chord being left behind) with respect to the root note C (the foundation note) in the new chord, C major, is 7 – 1 (8).

   So, your brain feels a strong sense of satisfaction when the note B in the G major chord resolves to the root note C in the new chord, C major.

2. Similarly, the scale relationship of the note D in the G major chord (the chord being left behind) with respect to the root note C in the new chord, C major, is 2 – 1.

   Your brain feels a strong sense of satisfaction when the note D in the G major chord resolves to the root note C in the new chord, C major.

These two simultaneous moves—B moving up to C (7 – 1) and D moving down to C (2 – 1) combine to provide your brain with a feeling of assured, inevitable harmonic motion. Just like moving from the C major chord to the F major chord. Again, resolution from complex to simple frequency ratios has taken place.

6.6.10 THE HARMONIC SCALE: ONE DIRECTION HOME

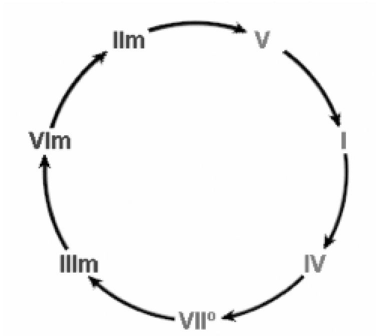
In melody, you have two directions home—by ascending through 7 to 1 (8), or by descending through 2 to 1.

But in harmony, as you've just seen, you have only *one direction home*—by *descending* the circular harmonic scale (moving clockwise).

In harmony, your brain senses the *descending fifth progression* of V – I as "coming home." Just as, in melody, it senses scale movements of 7 – I (8) and 2 – 1 as "coming home."

So, it's necessary to tweak the harmonic scale by adding arrows to show clockwise (descending fifth) natural direction of motion (Figure 50 below).

FIGURE 50 Harmonic Scale: One Direction Home



In harmony, when you paddle clockwise, you paddle with the current. When you paddle counterclockwise, you paddle against the current (with one small exception—third progressions—coming up in a while).

Or, you could say that, clockwise, you sail with the wind; counterclockwise, you sail against the wind. You have to mind your sheets, too. In sailing, sheets are lines attached to sail corners that control sail positions relative to the wind. So if three of them are blowin' in the wind, your boat will not be terribly manoeuvrable. That's what you get when you knock back too many margaritas ... you sail three sheets to the wind.

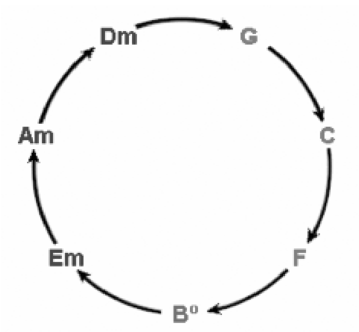
6.6.11 FIXING ANOTHER "MINOR" PROBLEM

So, the natural direction of motion as you progress from chord to chord through the harmonic scale has been nailed down. It's *clockwise*.

Still, the harmonic scale needs more work. Some of the harmonic intervals have less directional strength than others.

As always, an example reveals the problem. Once again, swap the Nashville Numbers of Figure 50 above for the chords of a pair of relative keys—C major and A minor, this time with the directional arrows added (Figure 51 below):

FIGURE 51 Harmonic Scale: Key of C Major / A Minor



You've probably noticed that the progression Em – Am does not quite measure up to the confident, resolved sound of, say, G – C.

When you progress from E minor to A minor, you move from these notes:

E – G – B

to these notes:

A – C – E

As usual, your brain checks out the new chord against the one left behind for signs that the new chord is assuming the role of the new tonic chord—at least for the moment. And here's what it finds:

1. The scale relationship of the note G in the E minor chord (the chord being left behind) with respect to the root note A (the foundation note) in the new chord, A minor, is ♭7 – 1 (8), not 7 – 1 (8).

   Your brain senses only a moderate sense of satisfaction when the note G in the E minor chord resolves to the root note A in the new chord, A minor.

2. The scale relationship of the note B in the E minor chord (the chord being left behind) with respect to the root note A in the new chord, A minor, is 2 – 1.

   Your brain feels a strong sense of satisfaction when the note B in the E minor chord resolves down to the root note A in the new chord, A minor.

Together, these two simultaneous moves—G moving up to A (♭7 – 1) and B moving down to A (2 – 1) combine to provide your brain with only a moderate feeling of harmonic motion.

Why isn't it a strong feeling of harmonic motion? Because the G – A move is ♭7 – I (8), not 7 – 1 (8).

Recall from Chapter 5 that a *semitone* interval has considerably more inherent tension than a whole tone interval, because a semitone is derived from a more complex frequency ratio (16:15), compared with a whole tone (9:8).

In the major diatonic scale, a semitone between 7 and 1 (8) points strongly at 1 (8). That's why the note occupying scale degree 7 is called the *leading tone*, *but only if it's a semitone* from 1 (8).

So, it's necessary to provide that Em chord with a leading tone, to make it strongly directional with respect to the Am chord. The way to do this is to sharpen the G in the Em chord, converting it into an E major chord.

When you do that, and progress from E major to A minor, you move from these notes:

E – G♯ – B

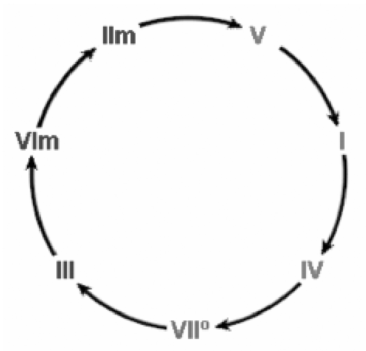
to these notes:

A – C – E

Now the relationship of the note G♯ in the E major chord (the chord being left behind) with respect to the root note A (the foundation note) in the new chord, A minor, is 7 – 1 (8), a semitone.

The chord progression in the harmonic scale therefore becomes III – VIm (instead of IIIm – VIm). Now the chord change has a strong directional quality (Figure 52).

FIGURE 52 Harmonic Scale with III in Place of IIIm



In the key of C major / A minor, when you play the chord changes, you can easily sense that the chord progression E – Am has much stronger directed quality than Em – Am.

To generalize, any descending fifth progression of two chords must have a *major triad* as its first chord in order to impart strong directed motion that terminates in a feeling of resolution. The *second chord* may be either a major or minor triad.

For instance, if you want to convey a feeling of strong directed motion to the chord progression IIm – V (e.g., Dm – G), you have to change the IIm to II, converting the progression to II – V (e.g., D – G).

VOICE LEADING, COUNTERPOINT, AND ALL THAT

Voice leading refers to continuity in the way one note moves successively to the next—such as the notes of one chord moving ("leading") to the notes of the next chord. It's also called *part writing* because a "voice" is also called a "part," such as the "guitar part" or the "bass part" or the "lead vocal part."

You usually associate voice leading with counterpoint —the musical technique of writing or playing two or more "voices" as melodies that move simultaneously. J. S. Bach's fugues, for instance. Or rounds, such as "Row Row Row Your Boat Gently Down the Stream" or "Three Blind Mice" or "Frere Jacques (Are You Sleeping?)." That's counterpoint. Voice leading refers to how those various melodic lines behave with respect to each other. For example, if three different melodic lines are moving

together, each contributes one note to a continuously changing three-note chord.

Composers tend to heed certain maxims of counterpoint, such as:

- Voices that move in parallel third or sixth intervals sound fine—go ahead and use 'em.
- Voices that move in parallel fifths or octaves sound bad—avoid 'em.
- A major seventh (leading tone) should ascend to the octave.
- A flat seventh should descend to the sixth.

And so on.

Bands or groups that perform harmony vocals tend to observe these rules when they work out the harmony parts—even though the singers may not realize it.

You can't really separate counterpoint from harmony. Even if you've never heard of voice leading as it applies in counterpoint, you've almost certainly used it in your own music.

For example, when a backup singer sings harmony "by ear" to the lead vocal line, he or she uses contrapuntal motion.

- It's ***parallel motion*** when the lead and harmony voices move together, separated by the same type of interval, such as major and minor thirds, or major and minor sixths.
- It's ***similar motion*** when the lead and harmony voices move together, but are separated by varying types of intervals.
- It's ***oblique motion*** when one voice or part remains at the same pitch while the other moves upwards or downwards.
- It's ***contrary motion*** when one voice moves down the scale while the other moves up.

6.6.12
HARMONIC MOTION AND "MUSICAL PUNCTUATION" (CADENCE)

That dang harmonic scale still isn't quite finished. Before completing it, now's the time to introduce an important component of musical structure. (Much more on structure in Chapter 8.)

As you no doubt know, small groups of notes and chords form musical units (usually two to eight bars) called phrases. These units combine into larger structures such as periods, verses, bridges, choruses, sections, movements, and so on.

Musical structure parallels the organization of verbal discourse, with its phrases, sentences, stanzas, and paragraphs. That's not surprising, considering the intimate linkage in the brain between music and language.

The resolution at the end of a musical phrase is called a *cadence*. A cadence has melodic, rhythmic, and harmonic properties. It normally signals a return to the prevailing tonal centre.

By a wide margin, the descending fifth progression, V – I, is the most common, most important, and strongest harmonic cadence in music. When a musical phrase ends with a V – I progression, it sounds like "the end"—the end of that phrase, verse, chorus, or whatever the prevailing structure may be.

The V – I cadence has quite a few names:

- Full close
- Full cadence
- Perfect cadence
- Perfect close
- Authentic cadence
- Dominant cadence
- Final cadence

(They couldn't make up their minds.)

Other cadences include:

- Deceptive cadences such as V – VIm and V – IV. They're called "deceptive" because your brain expects to hear V – I, but gets "deceived," and hears V – VIm or V – IV instead. This prolongs and heightens the expectation of eventually getting to the tonic chord.

- Imperfect (incomplete) cadences such as I – V and II – V. When a phrase ends with a progression like this, your brain knows it ain't the end yet, and fully expects the music to continue to a more "final-sounding" resolution..

- Plagal cadence, IV – I, so called because this is the "amen" sung at the conclusion of a hymn.

But V – I is the only cadence in music in which *directed tension* gets *completely resolved*.

The V chord is known as the *dominant chord*. (The female V chord is known as the *dominatrix chord*.) That's because it's through the V chord that the I chord derives its power as the tonal chord.

The V chord dominates harmonic action through its exclusive *directional* relationship with the tonic chord. If you were playing musical chess, the V chord would be the queen (the most powerful player on the board) and the I chord would be the king.

The V – I cadential progression maintains tonality in the midst of a maelstrom of rapidly changing melodic intervals and shifting harmonic tensions.

In melody, all scale degrees have *both tension and direction* with respect to the tonic note (except the tonic note itself, of course). But in harmony ...

- Only one harmonic degree, the V chord, has *both tension and direction* with respect to the tonic.

- Only one harmonic degree, the tonic chord in root position, has *no tension and no direction.*

- All other chords have *tension but no direction* with respect to the prevailing tonality.

The restful, balanced tonic chord makes possible the necessary contrast that gives all the other chords their edgy, restless, tense, and exciting qualities.

For example, in the key of C major, the F major chord, even though it's a simple triad, has tension, simply because it's *not the tonic chord*.

The constituent notes of the F major chord belong comfortably in the key of C major. But playing the F major chord does not point your brain back to the tonic chord, C major.

Same goes for the other chords in Figure 51 above—except G major. As the V chord, it's the only chord that points directly at the C chord.

The chord movement V – I serves pretty much the same punctuation function in music as the period does in written language. In music, a cadence marks the end of a phrase. It's a definite break, usually followed by a period of several seconds before the next phrase starts.

Spoken language does not have an equivalent to music's cadence. When you talk, you use phrases and sentences, of course, but you don't pause for several seconds at the end of every phrase and sentence. You just keep on talking until you're finished.

IMPORTANT:

- In a spoken conversation, you don't need to remember and keep track of every word because mentalese records the *gist*. Each word has symbolic (referential) meaning that relates to your already-memorized vocabulary of words.

- But in music, you *do* need to structure the music so that the listener can keep track of the phrases as they unfold in time because *music does not carry referential meaning*. You need to **repeat phrases often**, and you need to **pause between phrases**, usually via cadences. Without cadences in music, your brain has a hard time taking it all in.

That's one function of the cadence. The other main one is to reinforce tonality.

In a full cadence, the melody usually comes to rest on the tonic note, a longer-than-usual note in an emphatic metrical position. These emphatic characteristics remind the brain which note is the tonal centre.

An imperfect cadence (also called a half cadence or partial cadence) creates a sense of expectation. You've only stopped at a roadhouse for a burger and fries, but home is coming up, a little farther up the road. Often at the end of the next phrase. When a full cadence does *not* appear at the end of the next phrase, the brain really begins to wonder where things are going.

You can easily hear cadences performing their functions in any well-structured popular song, such as "Happy Birthday" (Figure 53), which has the following cadences:

I — V
V — I
I — IV

FIGURE 53 Cadences in a Popular Song: "Happy Birthday"

	Happy
I *birthday to*	**V (imperfect cadence)** *you. Happy*
V *birthday to*	**I (full cadence)** *you. Happy*
I *birthday dear*	**IV (imperfect cadence)** *El - vis. Happy*
I V *birthday to*	**I (full cadence)** *you.*

It's not that V – I is always used as a period or full stop. In music, the V – I cadence also shows up in many subtle, often transient ways, depending on the musical context.

Deceptive and imperfect cadences serve roughly similar functions in music as commas and semicolons serve in written language. But, again, *no equivalent exists in spoken language.*

In the minor mode, the chord progression III – VIm serves as the "V – I" (the "perfect cadence") equivalent, because scale degree 6 of the major mode is the *tonic note* of the minor mode.

Enough about cadences, already. It's almost time to move on to the final tweak of the harmonic scale. After which it's on to the fun stuff (finally): how to use harmonic scales to create beautiful, powerful chord progressions. With lots of examples in the form of some of the world's greatest songs.

6.7 Inside the Circular Harmonic Scale

6.7.1 THE PROBLEM OF HARMONIC AMBIGUITY

When you play two major chords a fifth progression apart, an ambiguity arises. Here's a little experiment to try. Play this progression of major chords:

C – G – C – pause – G – C – G – pause – G – C – G

You're playing exactly the same two chords. But which key are you in, C major or G major?

The progression appears to start out in the key of C major, then seems to change to G major. Or does it? You can't really be sure.

The problem is that *all major triads are consonances*. So your poor brain has trouble identifying which of the two chords is the tonic chord.

Music depends for its vitality on establishing tonality, *then* disturbing it, *then* recovering it. Just like drama. If it's done right, music *is* drama. You start out in some sort of "normal" situation. Then someone or something comes along to upset things—which makes the situation dramatically interesting.

As every dramatist knows, you cannot wreak delicious havoc upon an established order unless you first establish the order upon which you can wreak the delicious havoc.

In music, you first have to establish order—tonality—*unambiguously* before you can disturb it. If you don't establish tonality, your brain has no context in which to process subsequent sonic information.

If you just play random chords, the music sounds just as unpalatable as a tune sounds if it's based on a random scale. (Recall the imaginary chalk marks on the cello fingerboard.)

Chords and scales only sound coherent if they're organized in accordance with the simple frequency ratios that your brain has evolved to comprehend.

In the above example, C – G – C – pause – etc., tonality is not established. The C major chord could be the I chord if the key is C. Or it could be the IV chord if the key is G. And the G major chord could be the I chord if the key is G. Or it could be the V chord if the key is C.

Ambiguity prevails.

6.7.2 DISSONANCE TO THE RESCUE!

Good music works like good story-telling. There's conflict, suspense, intrigue. That's the function of *dissonant harmony*. As long as there's dissonance, you don't feel a sense of finality or resolution. So the brain expects more musical story-telling and an eventual release from suspense.

Resolution only comes with a return to scale degree 1, the tonic note (the centre of gravity) and the simple non-dissonant major triad. This usually happens periodically throughout the song, not only once at the end.

But if it happens too much and too often, the chord progression gets boring. Like leaving home but never venturing more than a few hundred metres before returning home.

The other extreme is going away for too long a time, getting lost and never finding your way back home.

So, in good songwriting, you have to know how much consonant harmony to balance with dissonant harmony. You want to make things interesting, but not so "interesting" that following the music gets so difficult and confusing that the listener zones out.

Getting back to the problem of ambiguity inherent in the progression ...

C – G – C – pause – G – C – G – pause – G – C – G

... fortunately, there's an easy fix. Just turn the V chord into a *dissonant chord*.

In the above example, if the G major chord were converted into a dissonant chord, your brain would know for sure that the key could not possibly be G major. That's because *the I chord is always a consonant triad.*

Recall that there are only two basic types of chords, namely, triads and sevenths. All triads (except diminished and augmented) are consonant. All seventh chords are dissonant because they all contain at least one interval that arises from a complex frequency ratio.

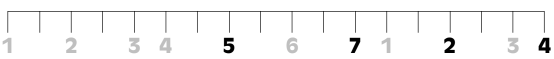
So, to convert that consonant V chord to a dissonant chord, the simplest thing to do is to add another note, converting it into a dissonant V7 chord ("five-seventh," in Nashville Number parlance).

6.7.3
THE DOMINATOR: WHY THE V7 CHORD CONTROLS HARMONY

Figure 54 below shows the four notes that comprise the V7 chord. This chord has three internal intervals:

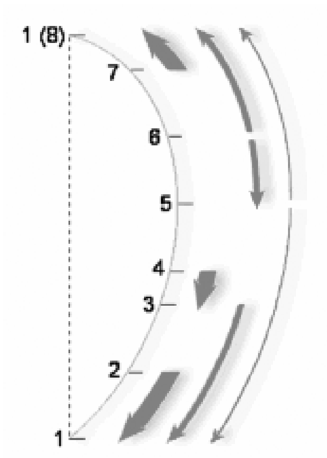
1. Major third (5 – 7, four semitones)
2. Minor third (7 – 2, three semitones)
3. Minor third (2 – 4, three semitones)

FIGURE 54 Notes of the V7 Chord: Scale Degrees 5, 7, 2, and 4



The V7 chord has some remarkable properties. Compare Figure 54 above with Figure 55 below:

FIGURE 55 Interval Dynamics



- The V7 chord contains the first note of all three of the most highly unbalanced intervals—scale degrees 2, 4, and 7; and
- The I chord contains the *second note* of all three of these intervals—scale degrees 1, 3, and 1 (8).

That's why the V7 chord desperately seeks to resolve to the I chord. It's down on its knees in the dirt, its horse having bolted, weeping and pleading, "Resolve me, resolve me."

(The V7 chord also seeks to resolve to the Im chord, but not quite as strongly. The Im chord has that ♭3 note, so the distance from the 4 note to the ♭3 is a whole tone instead of a semitone.)

When you progress from G7 to C major, you move from these notes:

G – B – D – F

to these notes:

C – E – G

1. The scale relationship of the note B in the G7 chord (the chord being left behind) with respect to the root note C (the foundation note) in the new chord, C major, is 7 – 1 (8).

   Your brain feels a strong sense of satisfaction when the note B in the G7 chord resolves to the root note C in the new chord, C major.

2. Similarly, the scale relationship of the note D in the G7 chord (the chord being left behind) with respect to the root note C in the new chord, C major, is 2 – 1.

   Your brain feels a strong sense of satisfaction when the note D in the G7 chord resolves to the root note C in the new chord, C major.

3. Finally, the scale relationship of the note F in the G7 chord (the chord being left behind) with respect to the middle note E in the new triad, C major, is 4 – 3.

   Your brain feels a strong sense of satisfaction when the note F in the G7 chord resolves to the middle note E in the new triad, C major.

No wonder, then, that these three simultaneous moves:

- B moving up to C (7 – 1),
- D moving down to C (2 – 1), and
- F moving down to E (4 – 3),

combine to provide your brain with a feeling of "perfect" cadence.

The V7 chord also contains that most unstable of all intervals, the pitchfork-toting tritone. It's the interval formed by the fourth and seventh notes of the scale.

As if that weren't enough, the V7 chord subsumes the entire unstable diminished triad (VII°)—scale degrees 7, 2, and 4.

All of this makes the V7 chord ...

- Highly unbalanced and dissonant, and at the same time
- Strongly focussed, *directed at the tonic centre*, the I chord.

The V7 chord is the *only chord in harmony* capable of establishing tonality all by itself. It doesn't even need the I chord to do it!

The moment your brain hears a single V7 chord, without any other musical reference, without any reference whatsoever to the tonic chord or even the tonic note—the instant that V7 chord sounds, your brain knows where the dynamic centre is. *It knows what the key is.*

When the seventh is added to the V chord, the chord's name changes from the *dominant* chord to the *dominant seventh* chord.

Try that little experiment with the C and G chords again, but this time, substitute G7 for G, like this:

C – G7 – C – pause – G7 – C – G7 – pause – G7 – C – G7

Adding that seventh makes all the difference in the world. There's no ambiguity whatsoever. The key can only be C major.

The dominant seventh chord (V7) assumes its "dominant seventh" powers only if it's a *major* V chord with the seventh note added. If you add the seventh note to a *minor* V chord (such as Gm, changing it to Gm7), the minor seventh chord does *not* become a dominant seventh, thanks to the ♭3 note in the Gm7 chord. That ♭3 does a couple of things to sabotage the dominant seventh quality:

- It changes 7 – 1 (8) to ♭7 – 1 (8) with respect to the tonic note, C. The leading tone disappears, removing directionality.

- It removes the tritone, making the chord much more stable-sounding.

That's why the dominant seventh chord of a *minor* key is a *major* V chord with the seventh note added. Just like the dominant seventh chord of a major key.

If you were to hear only the single dominant seventh chord G7, without reference to any other chord (unlike the above "C – G7 – C" example), the key could be either C major or C minor, because G7 is the dominant seventh of both keys. These are called parallel keys. (More on this later in the chapter, in the discussion of various types of modulation.)

6.7.4 LAST TWEAKS OF THE HARMONIC SCALE

In light of all this, it's now possible to make three more adjustments to the harmonic scale, finalizing it.

1. The V chord must be changed to V7, the dominant seventh, so that it points *unambiguously* to I, the tonic chord of the major key.

2. Similarly, the III chord must be changed to III7, the dominant seventh, so that it points unambiguously to VIm, the tonic chord of the relative minor key.

3. And finally, since the harmonic scale subsumes the basic chords of *two* keys, a major key and its relative minor, it would help to identify the two tonic chords.

As for the VII° chord, it's always acutely dissonant, unbalanced. It can either be left it as it is or changed to a diminished seventh chord (VII°7). It doesn't really matter. Either way, the chord remains eminently unstable.

One interesting thing about the VII° chord. Because the four-note dominant seventh (V7) contains all three notes of the VII° chord (and three out of four notes of the VII°7 chord), you can often substitute the VII° or VII°7 chord in place of the V7 chord to create a striking harmonic effect.

By the way, the IV chord is called the *subdominant chord* of the major key because, even though it only contains notes from the major scale and forms the only other major triad (besides the I and V triads), the IV chord does not have "dominant" power to focus harmonic traffic towards the tonic, the way the V7 chord does.

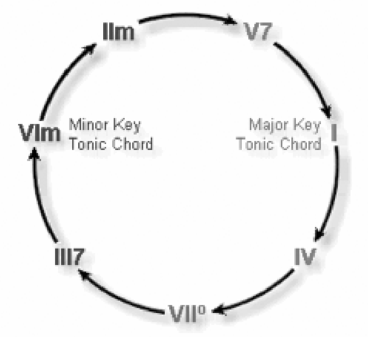
As a major triad containing two notes not found in the other major triads, the IV chord belongs with I and V7 as one of the three basic chords of the major key. But, since it doesn't have dominant power, it's necessarily "subdominant," like Deputy Fester.

The IIm chord serves as the subdominant of the relative minor key and belongs with VIm and III7 as one of the three basic chords of the minor key.

6.7.5
THE HARMONIC SCALE: FINAL ("DEFAULT") VERSION

At last, with the final revisions in place, it's show time for the harmonic scale (Figure 56).

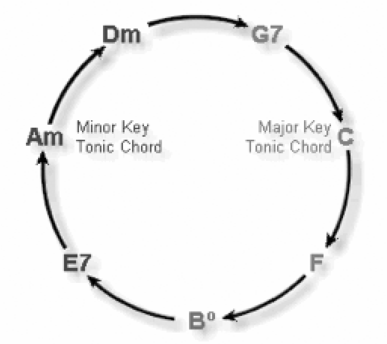
FIGURE 56 Harmonic Scale ("Default" Version)



In a little while, you'll learn how to creatively mess with the "default" version of the harmonic scale—customize it to create compelling chord progressions.

To try out the default version of the harmonic scale, once again swap the Nashville Numbers for the chords of the keys of C major and A minor (Figure 57):

FIGURE 57 Harmonic Scale ("Default" Version): Key of C Major / A Minor



In the sections ahead, you will learn how to use harmonic scales the way you use melodic scales (major or minor).

When you write a tune, do you simply go up and down the scale without skipping any notes? Without repeating notes? Without doubling back? Without reaching outside the scale to grab chromatic notes? Of course not! You'd never dream of limiting your melodic creativity that way.

Similarly, when you use a harmonic scale, you will not simply go round the circle clockwise, without skipping any chords, without doubling back, without grabbing chords from outside the harmonic scale.

A harmonic scale is not some formula that you have to adhere to rigidly, any more than a major scale is a rigid formula. A harmonic scale is just a scale, like a melodic scale. If you use harmonic scales intelligently, your music will just get better and better.

Both melodic and harmonic scales provide coherent frameworks that enable you to write music of infinite variety without sacrificing unity. Ultimately, that's why songwriters and composers use scales of any description, melodic or harmonic.

Your brain—and the collective brain of your audience—has evolved to reject tonal confusion and accept the tonal order (founded on simple frequency ratios) inherent in the octave, diatonic scales, the triad, and the harmonic scales.

6.7.6 TWO DIFFERENT ANIMALS: COMPARING THE CIRCLE OF FIFTHS WITH THE HARMONIC SCALE

You might have noticed a vague resemblance between the Circle of Fifths and the circular harmonic scale. Except for their shape, the two are *totally different*. Different in structure, different in function. Table 44 summarizes the differences.

TABLE 44 Summary of Differences Between the Circle of Fifths and the Harmonic Scale

	Circle of Fifths	Harmonic Scale
Shape	Circular arrangement of Key signatures.	Circular arrangement of chords.
Other Names for the Same Thing	• Heinichen's Circle of Fifths • Modulatory Circle of Fifths • Real Circle of Fifths	• Key-specific Circle of Fifths • Virtual Circle of Fifths **NOTE:** Do not use these names. They do not reflect reality, and will only confuse you.
Constituent Elements	Key signatures and letter names of keys.	Chords.
Number of Constituent Elements	12 key signatures representing 2 keys each.	7 chords.
Number of Keys Represented	24 keys—12 major keys and 12 relative minor keys.	2 keys—1 major and 1 relative minor key. (There are 12 different circular harmonic scales, one for each *pair* of keys—major and relative minor.)
Natural Direction of Motion	Clockwise or counterclockwise.	Clockwise is the "natural" direction.
Visual Representation of Major and Minor Keys	Represented in *parallel*. Major and minor keys form concentric circles.	Represented in *series*. Chords of one major key and one minor key form part of the same circle.

Main Purposes	• To show key signature formation. Proceeding clockwise, sharps increase by one. Proceeding counterclockwise, flats increase by one. • To show degree of relatedness of keys to each other. Keys adjacent to each other share all the same scale notes but one, so are musically closely related. Keys across the circle from each other share few of the same scale notes, so are musically remote.	• To show the natural direction of harmonic scale neighbours within a single pair of "relative" keys. Proceeding clockwise resolves harmonic imbalance and tension. Proceeding counterclockwise creates harmonic imbalance and tension. • To provide an easy way to identify third and second progressions. Second progressions are separated by one position on the circular scale. Third progressions are separated by two positions. • To show how dominant and subdominant chords relate to tonic chords. • To show secondary dominant chords. • To show how the chords of major and relative minor keys relate to each other. • To provide an easy visual means to spot pivot chords for purposes of modulation. Any two harmonic scales, no matter how musically distant their constituent keys, will always have at least two chord roots in common. These chords can be used to pivot smoothly between keys without losing tonal unity.

6.7.7 CIRCLE OF FIFTHS: THE MISTAKE OF TREATING KEYS AS "CHORDS"

For generations, students, songwriters, and even music teachers, unaware of the harmonic scale and how it works, have used the Circle of Fifths as a crude harmony-organizing tool.

Big mistake.

If you treat the key names in the Circle of Fifths as chord names and proceed around the Circle of Fifths counterclockwise, you get descending fifth progressions. (Such progressions even have a name: Circle-of-Fifth progressions.)

This is counter-intuitive, because the "natural" direction of the hands of a clock is obviously "clockwise" (the 12 positions of the Circle of Fifths are arranged to resemble a clock face). But apart from that, the Circle of Fifths has several major disadvantages as a harmonic scale stand-in:

1. No key-specific organizing framework. As you progress around the Circle of Fifths, you *exit the key after the second chord!* And you don't return unless you go all the way round the circle. (More on this in a moment.)

2. No connection between the chords of a major key and the chords of its relative minor. Not only is the bridging diminished chord missing, but the 12 minor chords are visually organized in their own separate circle. Again, if you start a chord progression in any given minor key, you exit the key after two chords and don't return until you go all the way round the circle.

3. No identification of dominant sevenths or subdominant chords for any given key.

4. No way to identify third and second progressions.

5. No way to identify pivot chords for purposes of modulation.

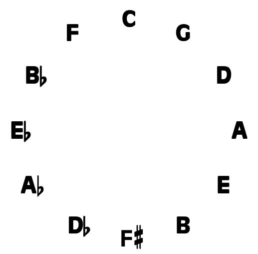
The Circle of Fifths has its uses, but not for showing pathways to meaningful, coherent chord progressions and harmonic movement.

Many musicians mistakenly think that the Circle of Fifths actually has something to do with chord progressions. Even authors of books on songwriting and music theory make this mistake, propagating rubbish and confusing their readers to no end.

To be clear: the Circle of Fifths shows key signatures and key relations—but not *chord* relations.

Here's an example of what happens when you treat the elements around the clock face of the Circle of Fifths as chords instead of keys. Presumably, you would want to progress around the Circle of Fifths as though it's a big circular chord progression. To simplify matters, consider the outer circle only, the elements that would be the major "chords" if the Circle of Fifths had anything to do with chords (Figure 58):

FIGURE 58 Circle of Fifths: Outer Circle Only



Start at the top of the Circle of Fifths with the first chord, which is C, the tonic chord in the key of C. Then, moving counter-clockwise around the circle, progress to the next "chord," which is F. Now you have a perfectly good two-chord progression in the key of C, namely C progressing to F.

So far, so good.

However (continuing counter-clockwise), the next "chord" you progress to is B♭. Now you've got a problem. The chord B♭ is not a chord in the key of C. Therefore, at this point you've actually exited the key of C.

As you progress the rest of the way round the Circle of Fifths, you do not re-enter the key of C until you get to the "chord" G.

Clearly, then, any notion that the elements of the Circle of Fifths having anything to do with chord progressions is wrong. The Circle of Fifths shows relationships among and between *keys*, not relationships among and between chords within a given key.

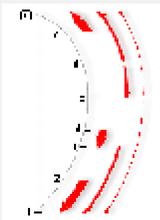
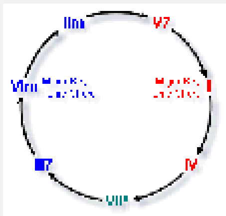
To summarize, the Circle of Fifths does not work as a chord progression device. That's the job of the harmonic scale—which also happens to be circular in shape, but has no functional relationship with the Circle of Fifths.

6.7.8 COMPARING MELODIC SCALES WITH HARMONIC SCALES

Before discussing how to make practical use of harmonic scales for fun and profit, here's a summary of the differences between melodic scales and harmonic scales (Table 45):

TABLE 45 Summary of Differences Between Melodic Scales and Harmonic Scales

	Melodic Scales	Harmonic Scales
Scale Units	Notes (pitches).	Chords (triads, sevenths, etc.).
Number of Units in Scale	Normally 5 to 7 notes, not including repetition of the octave note.	Always 7 chords. However, each harmonic scale position may be occupied by one of numerous *variants* of the "default" chord.
Number of Scale Types	Many types, including major and minor diatonic, pentatonic, modal, Indian, Arabic, etc.	Only one type: the harmonic scale.
Number of Scales in Western Tonal System	24 in total: one melodic scale for each major key and one for each minor key. (Note: there are several minor scale variants: natural minor, melodic minor, harmonic minor.)	12 in total: one harmonic scale for each pair of relative keys—major and relative minor.
Scale Degree Numerical Labels	Arabic numbers represent scale-degree notes. For example, the notes of the diatonic scale are represented as 1, 2, 3, 4, 5, 6, 7, 1(8).	Nashville Number System: Roman numerals represent chords named for their scale-degree roots. Alphabetic letters, Arabic numbers and other symbols represent chord functions. For example: I Major triad with root of scale degree 1 IIm Minor triad with root of scale degree 2 V7 Dominant seventh chord with root of scale degree 5 VII° Diminished chord with "root" of scale degree 7 (in reality, diminished chords are rootless)

Scale Degree Alphabetical Labels	Alphabetic letters represent the notes of a specific melodic scale. Accidentals follow the letter-names of the notes where applicable. For example, the D major scale is: D, E, F♯, G, A, B, C♯, D.	Alphabetic letters represent the chords of a specific harmonic scale. Accidentals follow letter-names of chords where applicable. Alphabetic letters, Arabic numbers and other symbols are then added, representing chord functions. For example, the harmonic scale for the key of D major and its relative minor is: D, G, C♯°, F♯7, Bm, Em, A7, D.
Normal Interval Movement Between Adjacent Scale Degrees	Melodic interval of a semitone or a tone.	Harmonic interval of a fifth progression.
Natural Direction of Movement	Ascending or descending are equally natural.	Descending only (clockwise) is natural.
Visual Representation	Vertical curve: 	One-way circle: 

6.8 Chase Charts: Chord Progression "Maps"

6.8.1 YOU CAN USE "MAPS" OF HARMONIC SCALES TO CREATE BEAUTIFUL, POWERFUL CHORD PROGRESSIONS

In the following sections, you'll find out how you can use visual "maps" of harmonic scales to:

1. Create compelling chord progressions that move by fifths, thirds, seconds, chromatically, or in combinations.

2. Modulate from any key to any other key and back again.

3. Create endless variety in chord progressions by substituting chord variants at any of the seven positions in the "default" circular harmonic scale. (You can substitute 30 or more different types of chords at *each* of the seven positions—chords such as minor sixths, minor sevenths, major sevenths, ninths, and so on.)

4. Use multiple chord variants at any of the seven positions in the harmonic scale within the same song.

You'll also learn a fast, easy way to visually differentiate chord progressions that sound strong and appealing from chord progressions that sound weak and unappealing.

To do all this, you need to learn how to draw a little map-like diagram called a Chase chart.

6.8.2 WHAT'S A CHASE CHART?

It's a circular harmonic scale diagram, a "map" of a chord progression, that enables you to eyeball a chord progression for any song.

With a Chase chart, you can actually *see* chord progressions at work!

Chase charts are easy to learn to sketch, and wickedly effective. You don't need to know anything about reading music. If you use Chase charts in your own songwriting, the results will amaze you.

You can sketch a Chase chart for any of your own songs or any other songs you choose. Suppose, for example, you hear a song that has a particularly striking, compelling chord progression. Want to know exactly what makes it striking and compelling?

You can find out in a only few minutes by doing a Chase chart.

You can use Chase charts to visually explore the chord progressions of any kind of song, any genre—pop, rock, jazz, country, folk, blues, you name it. Even classical music.

The discussion coming up shows you examples of Chase charts for the following selection of great songs of diverse genres (Table 46), most from the GSSL.

TABLE 46 Chase Charts of a Selection of Songs (Comin' Up)

"All Along The Watchtower"	"It Was A Very Good Year"
"Blue Moon"	"Jambalaya"
"Bridge Over Troubled Water"	"Kaw-liga"
"Carefree Highway"	"Kodachrome"
"Crazy"	"Lovesick Blues"
"Danny Boy"	"Midnight Train To Georgia"
"Dear Landlord"	"Moondance"
"Five Foot Two"	"One Fine Day"
"Free Man In Paris"	"Return To Sender"
"Georgia On My Mind"	"September Song"
"Gimme Shelter"	"Sittin' On The Dock Of The Bay"
"Girl From Ipanema"	"Star Spangled Banner"
"Heart And Soul"	"Sundown"
"Heartbreak Hotel"	"Three Bells (Jimmy Brown Song)"
"Hey Jude"	"Tracks Of My Tears"
"Hey Joe"	"Trouble In Mind"
"I Got Plenty O' Nuttin'"	"Walking After Midnight"
"I Heard It Through The Grapevine"	"When A Man Loves A Woman"
"I've Got You Under My Skin"	"Wild Horses"
	"Yesterday"

Using Chase charts, you will soon see precisely how and why the chord progressions of these brilliant songs work. And how you can apply the chord progression techniques in your own songwriting.

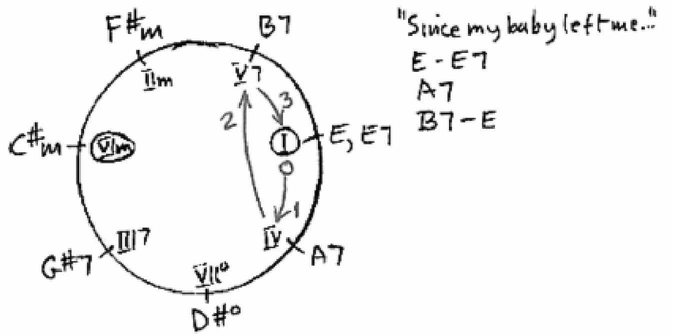
6.8.3
WHAT DOES A CHASE CHART LOOK LIKE?

To do a Chase chart of any song's chord progression, you need the following:

1. A pencil or pen and some paper.
2. A lyric sheet showing the chords for the song. You can use a lead sheet if you want to, but you don't need the melody. Just the chords.
3. Instructions on how to do Chase chart. Coming up momentarily.

But first, here's an example of what a Chase chart looks like (Figure 59). As you can see, it's just an innocent-looking little diagram—a harmonic scale diagram that "maps" the pattern of the song's chord progression. Small and simple—but it packs a powerful punch. (Chase charts can get pretty elaborate.)

FIGURE 59 Chase Chart of "Heartbreak Hotel" (Words and Music by Hoyt Axton's Mom, Mae Boren Axton, 1956)



Think of a Chase chart diagram as a "map" of a song's chord progression. The above example illustrates Chase chart basics:

- The circle is the harmonic scale for a particular key. You can use whatever key you like. In this example, the key happens to be E major / C♯ minor.

- Numbered arrows point from one chord to the next chord in the progression.

- The first arrow (numbered "1") has a **little circle at its base,** signifying the beginning of the chord progression.

What makes Chase charts so useful in songwriting is that they reveal certain specific patterns and characteristics, which you'll learn from the upcoming examples. These patterns visually disclose the strengths, weaknesses, and potential appeal of various chord changes.

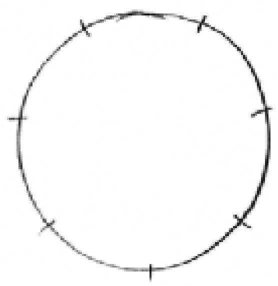
6.8.4 HOW TO SKETCH A CHASE CHART

Draw a small circle, perhaps a couple of inches (5 cm) in diameter. Make seven tick marks around the circle:

- One at the bottom in the middle,
- Two at the top, like little horns,
- Two on the left side, and two on the right side.

Try to space the seven tick marks more or less equally, as in Figure 60.

FIGURE 60 Chase Chart Outline

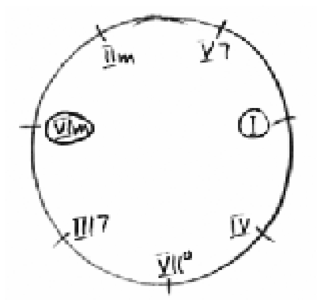


Next, add the harmonic scale's Nashville Numbers to the *inside* of the circle. Draw a small circle around VIm and I. These are the minor and major tonic chords (Figure 61 below).

IMPORTANT: The Nashville Numbers around the inside of the circular harmonic scale *never change*. Ever. The Nashville Numbers around the inside of the circle are the "default" chords. They serve as your reference points. However, as you'll see in a second, the chords around the *outside* of the circular harmonic scale can vary quite a bit.

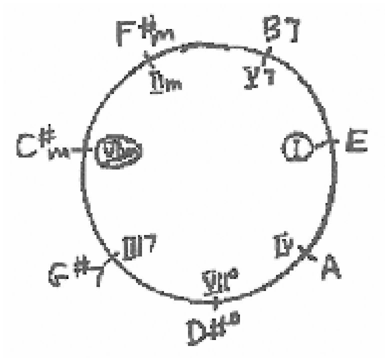
If you forget which Nashville Numbers belong to which tick marks, you can look them up at the back in **Appendix 1,** ***Roedy Black's Chord Progression Chart.***

FIGURE 61 Chase Chart Showing Nashville Numbers and Circled Tonic Chords



Next, add the specific chords for the key of the song whose chord progression you want to have a look at. These go around the *outside* of the circle. You can get them from the *Chord Progression Chart*, Appendix 1 (Figure 62):

FIGURE 62 Chase Chart with Nashville Numbers Around the Inside, and Chords for the Key of E Major / C♯ Minor Around the Outside



So far, you have the harmonic scale for the key of the song. Next, you will need to draw some arrows inside the circle, connecting the chords of the song in sequence. But first ...

6.8.5 SOURCES OF HARMONIC SCALE CHORDS WITH NASHVILLE NUMBERS FOR EVERY KEY

Roedy Black's Chord Progression Chart, reproduced in Appendix 1, shows the harmonic scale chords and Nashville Numbers for all 12 pairs of keys (major and relative minor).

The Chase chart in Figure 62 above is the same as the first diagram in the middle column of the *Chord Progression Chart*.

Another source of harmonic scale chords with Nashville Numbers in every key is *Roedy Black's Complete Guitar Chord Poster*, which is available at

www.CompleteChords.com

The left side of this large laminated chart shows the fingering positions for the specific harmonic scale chords in every key.

(Harmonic scales are exclusive components of *Roedy Black's* series of music reference charts.)

Figure 63 below shows a segment of this poster (upper left, smaller than actual size). Under the heading "PRINCIPAL CHORDS," you can see the following Nashville Numbers:

I (tonic chord of the major key),
IV (subdominant chord), and
V7 (dominant seventh chord).

Under the heading "RELATIVE MINOR," you can see the following Nashville Numbers:

VIm (tonic chord of the relative minor key),
IIm (subdominant chord of the relative minor), and
III7 (dominant seventh chord of the relative minor).

The column under each Nashville Number shows the specific corresponding harmonic scale chords and fingering positions for each key. (Each horizontal color band shows the chords of a different key.)

FIGURE 63 Upper Left Segment of *Roedy Black's Complete Guitar Chord Poster*, Showing Harmonic Scale Chords ("PRINCIPAL CHORDS" and "RELATIVE MINOR")

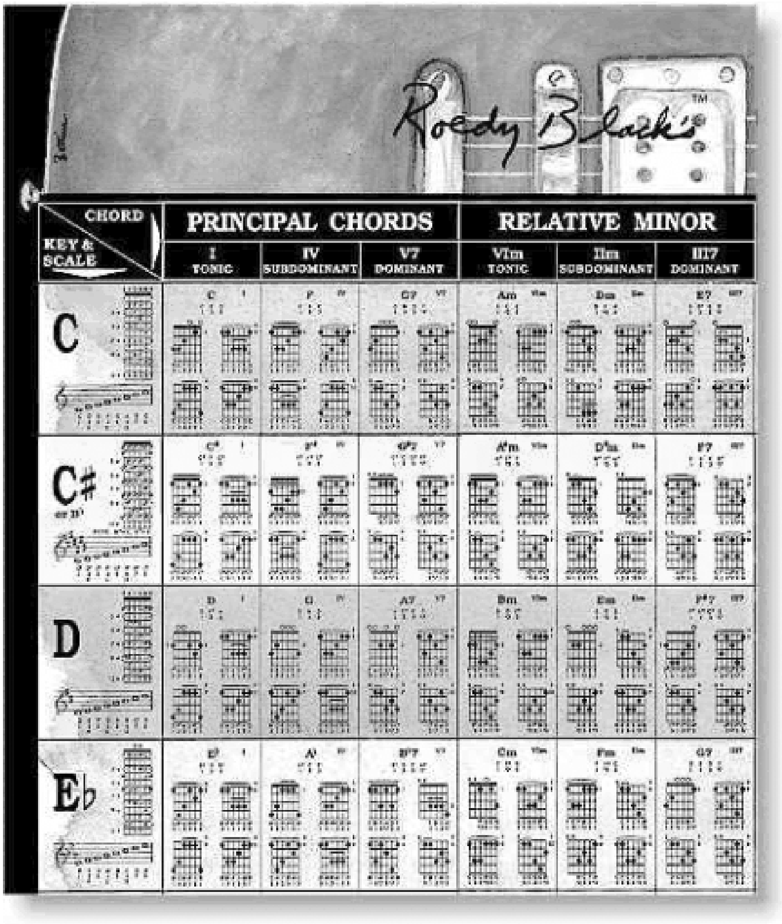
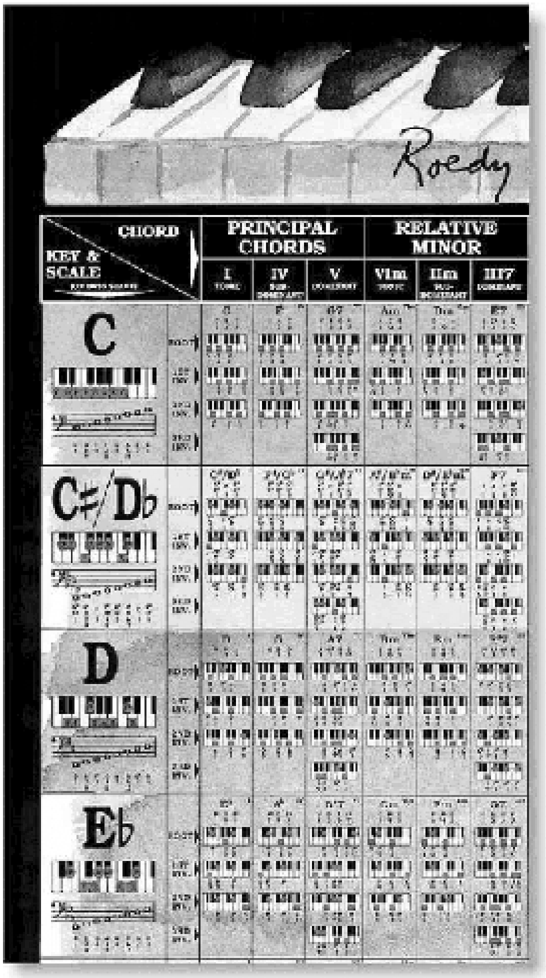


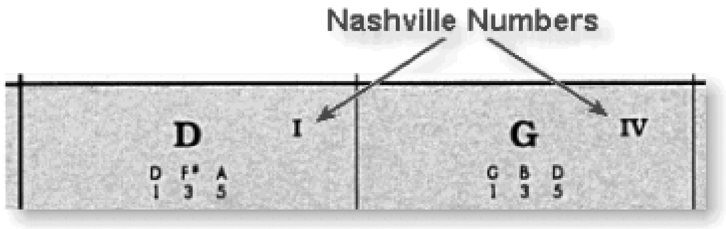
Figure 64 below shows a segment of *Roedy Black's Complete Keyboard Chord Poster* with the same information as displayed in Figure 63 above.

FIGURE 64 Upper Left Segment of *Roedy Black's Complete Keyboard Chord Poster*, Showing Harmonic Scale Chords ("PRINCIPAL CHORDS" and "RELATIVE MINOR")



These two charts also show you the Nashville Number for *each individual chord in each key* (Figure 65 below). So you don't have to figure anything out or look anything up.

FIGURE 65 Close-up Section of *Roedy Black's Compete Guitar Chord Poster* Showing Nashville Numbers for Each Chord



6.9 Chase Charts of the Four Types of Chord Progressions

6.9.1 HOW TO DO A CHASE CHART OF YOUR OWN SONG (OR ANY OTHER SONG)

Now that you've drawn a basic Chase chart with Nashville Numbers and the harmonic scale of a particular key, the last step is to draw arrows from one chord to the next chord *inside* the circular harmonic scales diagram.

Draw the arrows in the order that they occur in the chord progression of the song.

Never mind the melody. Never mind the time signature. Never mind the tempo. Never mind the meter.

In a Chase chart, the *only* thing of interest is the *chord progression.*

As discussed earlier in this chapter, there are four kinds of chord progressions:

1. Fifth progressions, up and down
2. Third progressions, up and down
3. Second progressions, up and down
4. Chromatic progressions, exiting and returning.

(If you happen to be a physics aficionado in search of mnemonic for fifth, third, and second progressions, up and down, Ellie Sue at the Dodge City Horse Store claims Ms Puma remembers them by associating them with up and down quarks, anti-up and anti-down antiquarks, and up and down escalators, respectively. Apparently, she associates chromatic progressions with all other flavours of fermions. Hope this helps.)

The key to the effectiveness of a Chase chart lies in recognizing and understanding the significance of the visual patterns the arrows make. Each type of chord progression has a distinct visual pattern.

6.9.2 CHASE CHARTS OF FIFTH PROGRESSIONS, UP AND DOWN

Recognizing the patterns of the various chord progression types is important because each type of chord progression has advantages you can exploit and disadvantages you can avoid.

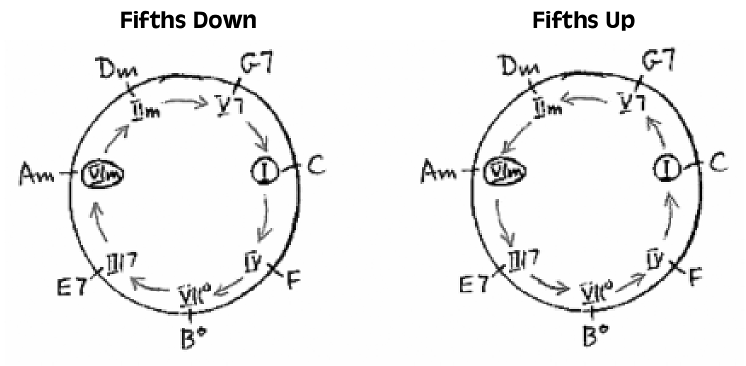
Figure 66 below maps the visual patterns of fifth progressions, up and down. The chords around the outside happen to be in the key of C major / A minor in this example. However, you could plug in the chords for any key you choose.

- Fifth progressions *down:* the arrows go *clockwise* around the circle.
- Fifth progressions *up:* the arrows go *counterclockwise* around the circle.

Around the inside of the circle, the Nashville Numbers always remain the same.

Recall that "fifth progression" simply means a progression of two chords whose roots are five scale notes apart. Figure 66 below shows the Chase chart patterns of fifth progressions down and up.

FIGURE 66 Chase Chart: Fifth Progressions, Down and Up



The fifth down is the strongest chord progression in harmony. In the Chase charts of examples of GSSL songs, you'll see sections of the above patterns everywhere—especially fifth-down patterns.

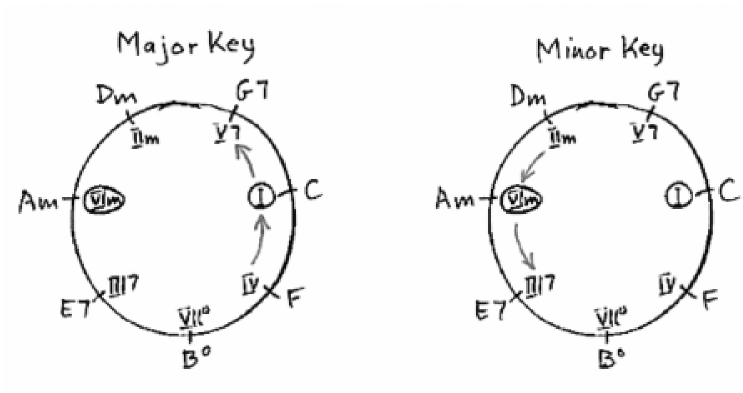
The fifth down has one main drawback. Because it's so powerful, everybody uses it. It's the most commonly used type of progression. Safe and familiar. A string of fifth-down progressions sounds so familiar as to create an effect of predictability—but it's a comfortable predictability.

Fifths *up*, on the other hand, are usually weak progressions. But not always ...

6.9.3 CHASE CHARTS OF FIFTHS UP, TO AND FROM THE TONIC CHORD

Fifths up *to the tonic* from the IV chord, and fifths up *from the tonic* to the V7 chord, have considerable power, owing to their special relationships with the tonic chord (as discussed in snoring detail earlier in this chapter). Figure 67 below maps the Chase chart patterns of fifths up, to and from the tonic.

FIGURE 67 Chase Chart: Fifths Up, To and From the Tonic

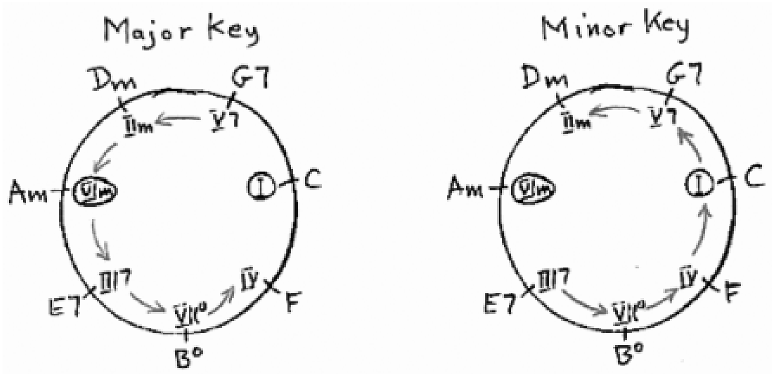


Note that in Figure 67, the arrows in the "minor key" diagram point downwards on the page. But those are still fifth-up progressions—the arrows go *counterclockwise*, the fifth-up direction.

6.9.4 CHASE CHARTS OF FIFTHS UP, AWAY FROM THE TONIC CHORD

Fifth-up progressions that *do not* involve the tonic tend to be weak (Figure 68):

FIGURE 68 Chase Charts: Fifth Progressions Up, Away from the Tonic Chord



Clunky sounding chord progressions are often found to have consecutive fifth-ups, *away from the tonic.* Not always, but more often than not.

6.9.5 CHASE CHART OF SECONDARY DOMINANTS

Secondary dominants apply only to fifth down progressions. Discussions of secondary dominants often get complicated and mystical.

No need. It's completely straightforward:

> **A secondary dominant is a V or V7 chord of a harmonic degree other than the tonic chord.**

In Figure 69 below, the A7 variant chord in place of the default chord Am becomes the secondary dominant of the D-based chord that follows. The progression A7 – D is a fifth down progression. The chord A7 is the secondary dominant of D.

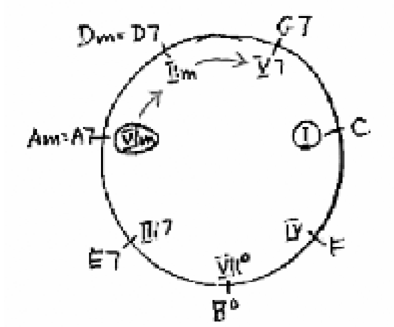
Similarly, D7, the variant chord in place of the default Dm, becomes the secondary dominant of the G-based chord that follows. The progression D7 – G7 is a fifth down progression. The chord D7 is the secondary dominant of G7.

A *variant chord* is a chord having the same root (letter-name) as the default chord at any of the seven positions around a circular harmonic scale. For example, in Figure 69 below, at the IIm position, Dm is the default chord. However, you could

substitute any other chord beginning with the letter D at the IIm position, such as D7, Dsus4, Dm7, D9, D13♭9, or any of 30 or more other "D" chord *variants*. (Chord progressions are combinatorial.)

In Figure 69, the default chord in the IIm position is Dm. To make this a secondary dominant, you substitute the *variant chord* D7 in place of the usual Dm chord. The chord D7 then become the secondary dominant of G7.

FIGURE 69 Chase Chart: Secondary Dominants



Secondary dominants are also called *tonicizations* (discussed in Chapter 5) because they briefly make the next harmonic degree chord the tonic. Examples coming up will show you how secondary dominants are used in songs.

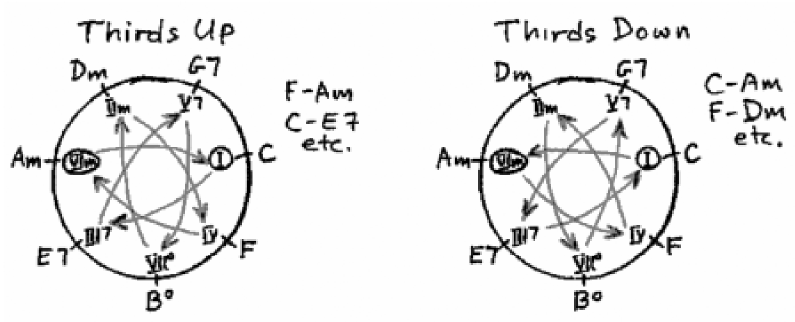
6.9.6
CHASE CHARTS OF THIRD PROGRESSIONS, UP AND DOWN

Figure 70 below maps the patterns for third progressions, both "up" and "down."

In a Chase chart, the visual characteristic of a third progression is that the arrow goes across the circle, skipping two chords on one side of the arrow, and three on the other.

Thirds and other chord progressions except fifths crisscross the circle in all kinds of patterns, as you'll see in the examples coming up.

FIGURE 70 Chase Chart: Third Progressions, Up and Down



Third progressions, up or down, tend to be pretty weak, because the two chords that make up a third progression have two notes in common. For example, the chord C major consists of the notes C, E, and G. The chord A minor consists of the notes A, C, and E.

On the other hand, the fact of having two notes in common makes third progressions sound pretty smooth, which has its advantages. The familiar third-down progression C – Am, for example, sounds remarkably smooth.

Third progressions involving a major and a minor chord can sound quite palatable because of the major-minor mood contrast.

As well, third progressions sound stronger if one of the two chords in the progression is altered such that the two chords no longer have two notes in common. For example, the progression C – Em is a typical third progression with the two chords having two notes in common:

- C chord = C, E, G; Em chord = E, G, B.
- Changing Em to E7 removes one of the notes in common: E7 = E, G♯, B, D. Also, as a seventh chord, E7 contains the tritone (like all seventh chords), so it's conspicuously dissonant, adding to harmonic interest.

Chord progressions by thirds have opposite directionality to progressions by fifths:

- Thirds *down* progress *counterclockwise* (e.g., C – Am)
- Thirds *up* progress *clockwise* (e.g., C – E7)

Repeat: this is exactly the *opposite* of fifth-progression directionality.

Thirds down tend to be more popular than thirds up.

6.9.7 CHASE CHARTS OF SECOND PROGRESSIONS, UP AND DOWN

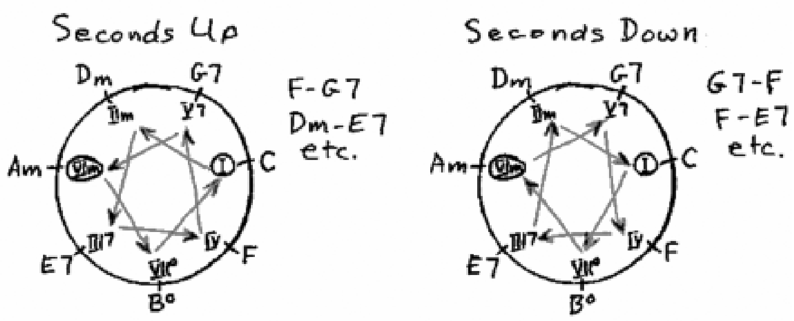
Figure 71 below maps the Chase chart patterns for second progressions, up and down.

In a Chase chart, the visual characteristic of a second progression is that the arrow skips one chord in the circle.

Chord progressions by seconds have the same directionality as progressions by fifths:

- Seconds *down* progress *clockwise* (e.g., C – B°)
- Seconds *up* progress *counterclockwise* (e.g., C – Dm)

FIGURE 71 Chase Chart: Second Progressions, Up and Down



Second progressions, both up and down, have a lot of power (almost as much as fifths down) because the two chords in the progression have no notes in common. For example, the chord C major consists of the notes C, E, and G. The chord D minor consists of the notes D, F, and A. So the progression C – Dm marks a significant harmonic change. It's a strong progression.

The main disadvantage is that clumsy use of second progressions can blur the sense of tonality.

In general, in any Chase chart, the closer the arrows are to the edge of the circle, the stronger the progression: fifths first, then seconds, then thirds.

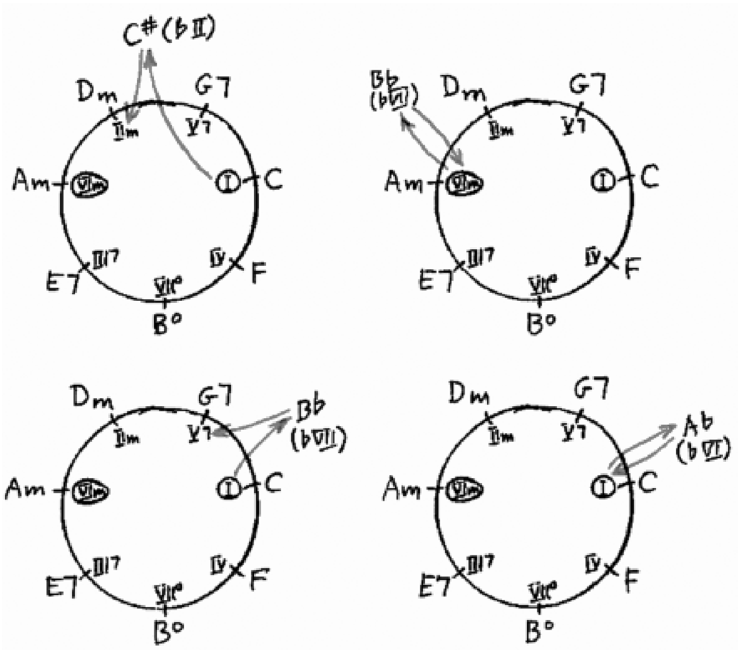
6.9.8 CHASE CHARTS OF CHROMATIC PROGRESSIONS, EXITING AND RETURNING

A chord whose root lies outside the diatonic scale of the prevailing key is a *chromatic chord*. In a Chase chart, a chromatic chord is located *outside of the circular harmonic scale*.

The visual pattern shows an arrow connecting the exit chord of the harmonic scale with the chromatic chord. Another arrow connects the chromatic chord with the return chord of the harmonic scale (Figure 72).

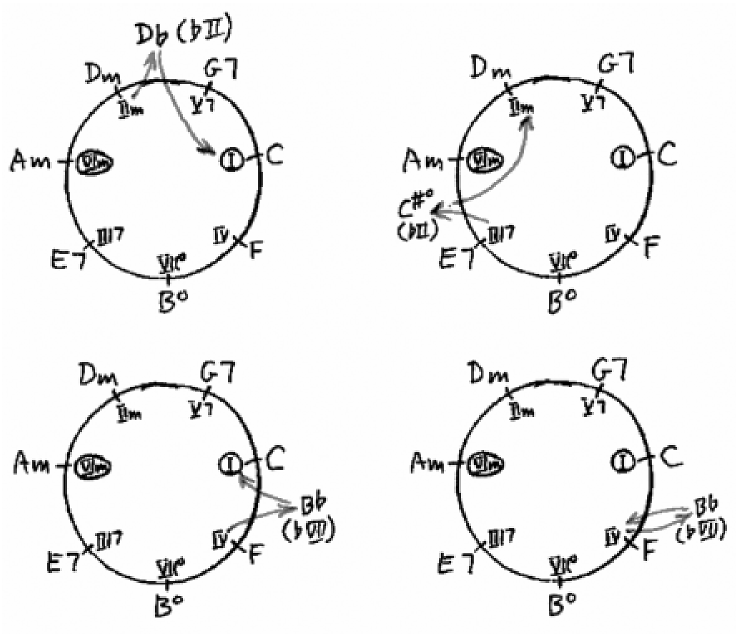
Visually, the chromatic chord is usually positioned between the exit and return chords. Sometimes the same harmonic scale chord is used as both exit and return chord. This is represented by two side-by-side arrows pointing in opposite directions.

FIGURE 72 Four Chase Chart Examples of Chromatic Chord Progressions: Exit Chord Is the Tonic Chord



Less frequently, the exit chord of a chromatic chord progression is a chord other than the tonic. Figure 73 below shows some examples.

FIGURE 73 Four Chase Chart Examples of Chromatic Chord Progressions: Exit Chord Is Not the Tonic



Like second progressions, chromatic progressions stand out. Chromatic chords are foreign to the key. They command listener attention.

However, tonality can easily fall apart with clumsy handling of chromatic chords. That's why it's prudent, when introducing a chromatic chord, to return to the harmonic scale quickly, usually within a bar or two. If this doesn't happen, it probably means the tonality (key) is changing (modulation).

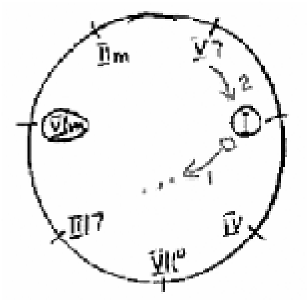
6.9.9 CHASE CHARTS OF THE GENERAL PATTERNS OF CHORD PROGRESSIONS

Figure 74 below maps the general pattern of a chord progression in a popular song or any other piece of music—from the humblest folk song to the grandest symphony.

Typically, the chord progression begins with the tonic chord, then progresses to several other chords and chord variants, and finally finds its way back to the tonic via the V7 chord:

I – [any number of other chords] – V7 – I

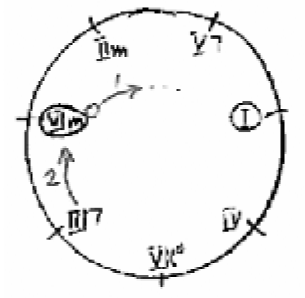
FIGURE 74 Chase Chart: General Pattern of a Chord Progression, Major Key



In a minor key, the chord progression typically starts with the VIm chord and finds its way back to the VIm chord via the III7 chord (Figure 75 below):

VIm – [any number of other chords] – III7 – I

FIGURE 75 Chase chart: General Pattern of a Chord Progression, Minor Key



6.10
Examples: Chase Charts of Great Songs without Modulation or Chromatic Chords

6.10.1
CHASE CHARTS OF FOUR GROUPS OF *GOLD STANDARD* SONGS

> The purpose of art is to stop time.
> —BOB DYLAN

You're about to learn chord progression techniques from some of the world's greatest songwriters, including:

Otis Blackwell	Van Morrison
Hoagy Carmichael	Willie Nelson
Bob Dylan	Cole Porter
George Gershwin	Otis Redding
Jagger and Richards	Smokey Robinson
Antonio Carlos Jobim	Richard Rodgers
Carole King	Paul Simon
Lennon and McCartney	Kurt Weill
Gordon Lightfoot	Norman Whitfield
Joni Mitchell	Hank Williams, Sr.
	...and others

The following sections examine the chord progressions of four groups of brilliant songs, using Chase charts.

- Group 1: Songs without modulation or chromatic chords
- Group 2: Songs without modulation, with chromatic chords
- Group 3: Songs with modulation, without chromatic chords
- Group 4: Songs with modulation and chromatic chords

Chapter 2 discussed why there's no such thing as "progress" in music. If you aspire to artistry in songwriting, as opposed to hackdom or fashion, then you seek to create *classics*, songs that transcend time, performer, and genre:

1. ***Time Independence.*** People who first hear the song *decades after it was written* take to the song and want to hear it and play it and sing it repeatedly.

2. ***Performer Independence.*** The song works well if someone other than the original performer does a cover.

3. ***Genre Independence.*** A performer working in a genre other than the genre associated with the original recording can render the song in a palatable way.

With the exception of a couple of centuries-old public-domain songs, the four groups of songs coming up for chord progression analysis were composed over a roughly 50-year period, from the 1920s to the 1970s. Most people would consider these song to be classics.

A reminder: a Chase chart only represents the chord progression of a song—*not* the tune and *not* the rhythmic elements.

6.10.2 GROUP 1: LIST OF GREAT SONGS WITHOUT MODULATION OR CHROMATIC CHORDS

Here's the first group of songs, nearly all of which are on the *Gold Standard Song List*. All of the songs in this group stay in the one key and do not borrow chords from other keys.

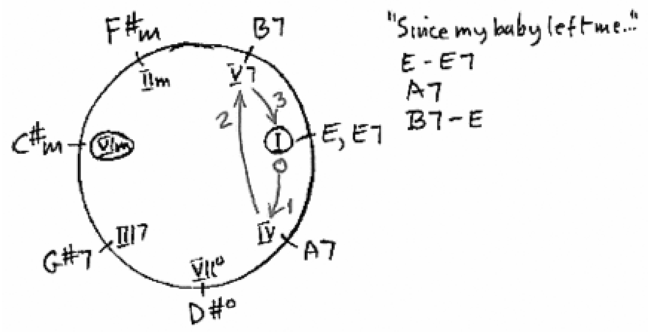
"Heartbreak Hotel"	"Heart And Soul"
"Tracks Of My Tears"	"Midnight Train To Georgia"
"Jambalaya (On the Bayou)"	"Danny Boy"
"When A Man Loves A Woman"	"Moondance"
"Walking After Midnight"	"All Along The Watchtower"
"Five Foot Two"	"I've Got You Under My Skin"
"Hey Joe"	"Yesterday"
"Return To Sender"	"Star Spangled Banner"
"Blue Moon"	

Study the Chase charts that follow. You'll pick up a lot of useful information about what makes the chord progressions work in these tunes. You'll also learn how easy it is use Chase charts to map the chord progressions of *your own* tunes or any other song with a chord progression you're curious about.

6.10.3 "HEARTBREAK HOTEL": I – IV – V EIGHT-BAR BLUES

"Heartbreak Hotel" was introduced as an example a little earlier. Have a look at Figure 76 as you go over the basic "rules" for doing Chase charts.

FIGURE 76 Chase Chart of "Heartbreak Hotel"



Chase Chart Basics

1. Start with a drawing of the circular harmonic scale with Nashville Numbers (Roman numerals) on the *inside* of the circle and the chords of the particular key around the *outside*. Remember: the Nashville Numbers on the inside *never change* but the chords around the outside do change. You will find the circular harmonic scales for all 12 major/minor pairs of keys in Appendix 1. You can choose any key you like. In "Heartbreak Hotel," the choice of the key of E major/C♯ minor is purely arbitrary.

2. To map the chord progression, start with the song's first chord and draw an arrow to the chord it changes to *other than a variant* of the first chord.

   In the example of "Heartbreak Hotel," the first chord is E major. The next chord is E7, a *variant* of E major. For this chord change, you don't need to draw an arrow, since E7 is just a variant of E major. All you need to do is label the chords at Nashville Number I as E and E7 to signify that the chord E and its variant E7 both appear at this position.

   Next, the progression goes to A7. So the first arrow you draw goes from Nashville Number I to Nashville Number IV on the inside of the circle. (Nashville Number IV corresponds to the "A7" on the outside of the circle, a variant of what would normally be the chord "A".)

3. Label the first arrow with the number "1" and draw a little circle at the base of the arrow labelled "1." This serves as an easy visual marker that shows where the chord progression within the circular harmonic scale begins.

4. Next, the progression goes to the chord B7, so draw an arrow from the A7 position (Nashville Number IV) to the B7 position (Nashville Number V7). Number that arrow "2."

5. Finally, the progression goes from B7 back to the tonic chord, E. So draw one more arrow from the B7 position (Nashville Number V7) to the tonic chord, and number that arrow "3."

6. If the same chord change repeats, do not give the arrow another number.

For a simple chord progression such as the one for "Heartbreak Hotel," you'll only need to use one circle to map the whole progression. As you'll see later, if the chord progression gets complicated, a Chase chart can get cluttered with too many arrows. When that happens, all you need to do is start another circle and continue on. Draw as many harmonic scale circles as you need. You may need several harmonic scale circles to do a Chase chart of one song.

Also, wherever the chord progression takes an obvious turn, which often happens when verse changes to chorus or bridge, start a new harmonic scale circle.

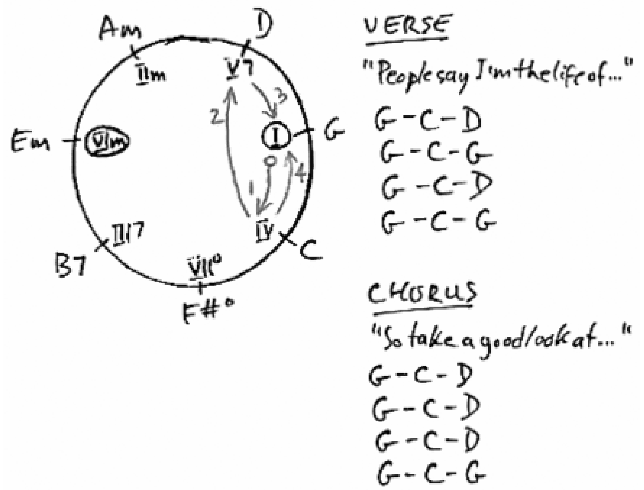
"Heartbreak Hotel" is an excellent example of a chord progression that orbits clockwise around the gravitational centre, the tonic chord. The progression moves from harmonic degree I to IV to V7 to I.

You can think of the chord progression for this song as a variation of the classic 12-bar blues pattern. It's just compressed into 8 bars.

6.10.4 "TRACKS OF MY TEARS": SUSPENSE OF HALF-CLOSES

The Chase chart of this song's chord progression shows the same three-chord orbit pattern as "Heartbreak Hotel." But "Tracks Of My Tears" has a subtle change in the chord progression of the chorus that makes a big difference (Figure 77):

FIGURE 77 Chase Chart of "Tracks Of My Tears" (Words and Music by Smokey Robinson, Warren Moore, and Marvin Tarplin, 1967)



In the verse, half closes alternate with full closes. A half close or half cadence is an imperfect cadence, a cadence that ends on the dominant chord. It leaves the ear in suspense, waiting for resolution.

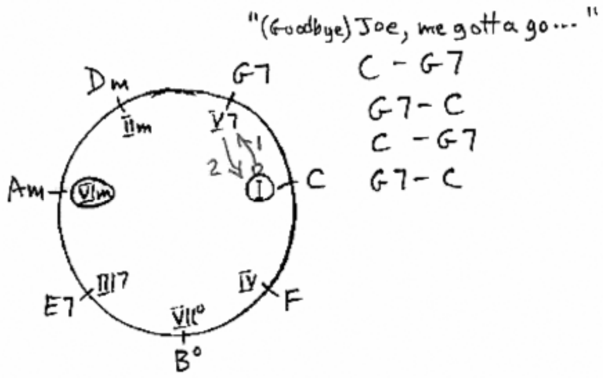
In the chorus, unlike the verse, half closes continue until the end of the chorus. This infuses the chorus with a greater urgency to resolve. It keeps your brain in suspense.

It's better to use a string of half closes like this in the chorus than in the verse. It's an effective technique used masterfully in this song.

6.10.5 "JAMBALAYA (ON THE BAYOU)": THE STRONGEST CHORD PROGRESSION IN ALL OF MUSIC

Wanna write a two-chord classic song? You could not pick two better chords than I and V7. Hank Williams, Sr., shows how it's done (Figure 78).

FIGURE 78 Chase Chart of "Jambalaya (On The Bayou)" (Words and Music by Hank Williams, Sr., 1952)



Chord progressions don't get any simpler. And yet, over the centuries, that I – V7 – I progression has taken on all the other chord progressions in harmony and arm-wrestled them into submission.

In "Jambalaya," fully half the song has unstable dominant seventh harmony, which keeps the listener on edge, expecting resolution.

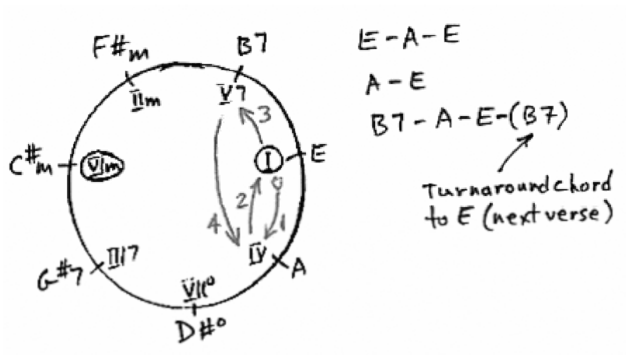
In this song, Hank's doing some interesting things melodically, too, which is why everybody knows the tune. It's way, way easier to write a boring ol' country song with a I – V7 – I chord progression than a great classic country song with a I – V7 – I. Chapter 9 discusses in detail what goes into making a memorable tune.

6.10.6 TWELVE-BAR BLUES: DECEPTIVE CADENCE AND "TURNAROUND"

You saw how the chord changes in "Heartbreak Hotel" and "Tracks Of My Tears" simply orbit the tonic chord. Same thing with zillions of songs. Usually the orbit goes clockwise.

But sometimes the orbit reverses itself (Figure 79):

FIGURE 79 Chase Chart: 12-bar Blues



The final four-bar phrase of a 12-bar blues tune usually contains a deceptive cadence. That is, the V7 chord (B7 in the above example) does not resolve directly to the tonic.

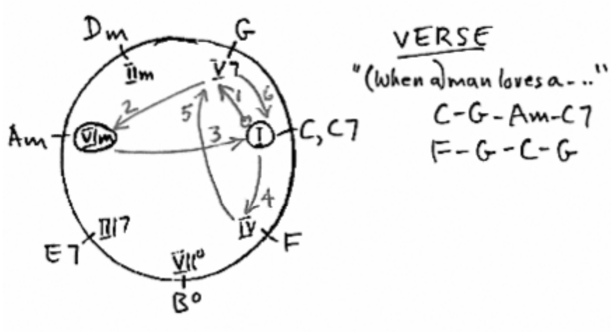
The progression instead takes a detour through the IV chord (A in this example), comes to rest briefly on the tonic, then immediately "turns around" on the V7 chord to start the cycle over again. This keeps the tune driving on.

A cadential chord formula of this nature, usually in the last bar or two of a section, is called a *turnaround*. Some players call it a *turnback*.

6.10.7 "WHEN A MAN LOVES A WOMAN": ANOTHER KIND OF DECEPTIVE CADENCE

The Chase chart of the verse of this song maps another way of using a deceptive cadence to keep your brain in suspense and the progression moving right along (Figure 80).

FIGURE 80 Chase Chart of "When A Man Loves A Woman" (Words and Music by Calvin Lewis and Andrew Wright, 1966)



This time, the progression moves from the V chord to the VIm chord, then to the I (tonic) chord, which takes the form of its unstable seventh variant (C7).

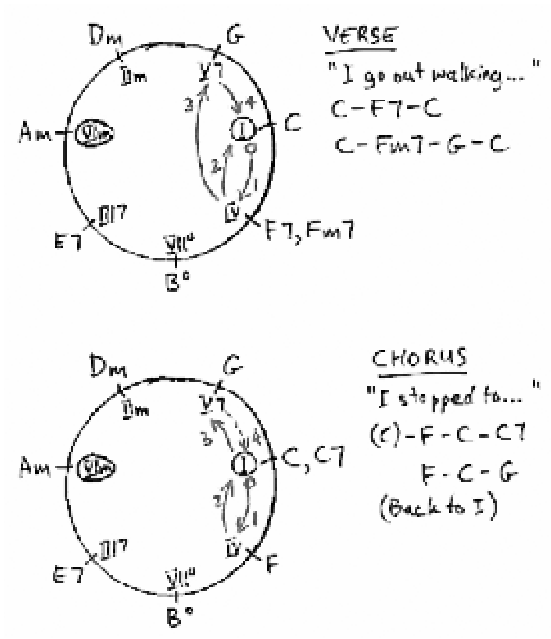
The tonic seventh in turn demands to move on to the IV chord. This keeps the progression moving, mostly via fifths and seconds, with only a single third progression (Am – C7).

6.10.8 "Walking After Midnight": Progression Reversal

In this tune, the Chase chart shows that three variant chords occupy harmonic degree IV: two in the verse and one in the chorus (Figure 81). These three chords are IV7, IVm7, and IV (F7, Fm7, and the default F, respectively).

"Walking After Midnight" is really a three-chord song, with variant chords at Nashville Number IV to provide harmonic variety. (Lyrically, the song is in the best tradition of country music, describing what it's like to stagger out of the saloon at midnight, only to find that your horse got bored and lonesome waiting around in the street and went home without you.)

FIGURE 81 Chase Chart of "Walking After Midnight" (Words by Don Hecht, Music by Alan Block, 1956)



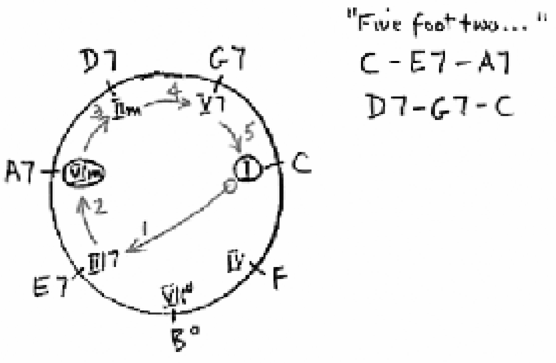
"Walking After Midnight" uses a chord progression technique you'll find in many country songs: the progression reverses itself in the chorus.

The verse progresses mostly in the common fifths-down pattern. But in the second part of the chorus, the pattern reverses to fifths up through the tonic. This creates a solid harmonic contrast between verse and chorus, providing more harmonic variety).

6.10.9 "FIVE FOOT TWO, EYES OF BLUE": CONSECUTIVE SECONDARY DOMINANTS

Consecutive secondary dominants impart substantial forward momentum to a tune. They're sevenths, and therefore unstable. And they move in fifth-down progressions. Here's a classic example (Figure 82):

FIGURE 82 Chase Chart of "Five Foot Two, Eyes Of Blue" (Words by Sam Lewis and Joe Young, Music by Ray Henderson, 1925)



This chord progression happens to skip the chords F and B°. What would happen if it didn't? What happens when the progression goes from the I chord, C major, to the IV chord, F major, in the form of a secondary dominant, F7?

An interesting situation arises.

If you want to continue with a string of secondary dominants, then the chord F7 would normally be the secondary dominant of B♭, not B. Therefore the progression would be on its way out of the key.

How come? Because the progression IV – VII° is the only progression in the circular harmonic scale where there are *six semitones* between the root notes of adjacent chords, instead of five semitones (Table 47).

TABLE 47 Semitones Between Chord Roots in the Harmonic Scale

Chord Progression	Example: Key of C / Am	Semitones Between Chord Roots
I – IV	C – F	5
IV – VII°	F – B°	**6**
VII° – III7	B° – E7	5
III7 – VIm	E7 – Am	5
VIm – IIm	Am – Dm	5
IIm – V7	Dm – G7	5
V7 – I	G7 – C	5

So, if F7 were to progress to B♭7, then B♭7 would be the secondary dominant of E♭. So B♭7 would function as a pivot chord, taking the progression into the new key (key of E♭).

However, F7 can also proceed pretty smoothly to B°7, which is harmonically close to B♭7:

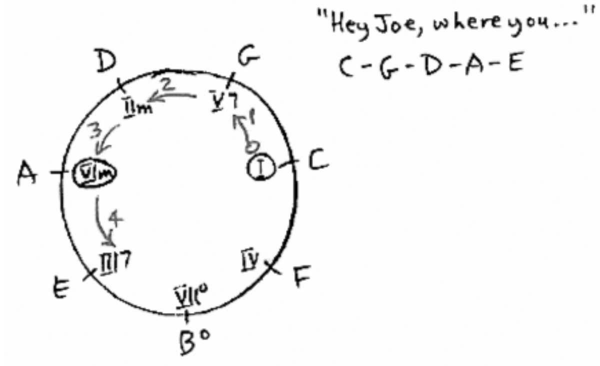
B°7 = B, D, F, A♭
B♭7 = B♭, D, F, A♭

And, being highly unstable, B°7 seeks to move on to the next chord, which is E7. So the progression remains in the prevailing key.

6.10.10 "HEY JOE": A FIFTHS-UP PROGRESSION THAT WORKS

With so many fifth-up chord changes, why does this song, immortalized by Jimi Hendrix, sound palatable (Figure 83)?

FIGURE 83 Chase Chart of "Hey Joe" (Words and Music by Billy Roberts, 1965)



Three reasons:

1. Movement to any chord from any other chord *of the same type* sounds palatable—especially if such movement forms a regular pattern of some kind (see the 10 chord progression guidelines near the end of this chapter). In this case:

    - All of the chords are the same type (major triads), and
    - The progression moves in the same fifth-up steps.

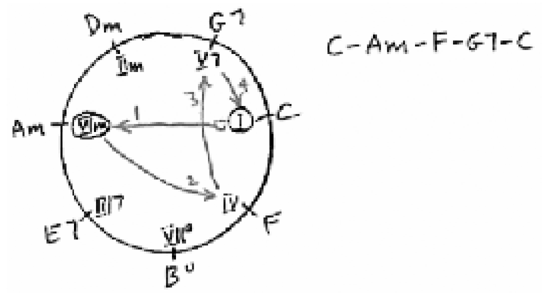
2. Using *only consonant chords* (major triads) helps offset the sonic weirdness of so many consecutive fifths up.

3. The first fifth-up progression is *from the tonic chord*, which makes it perfectly palatable, as discussed earlier in this chapter.

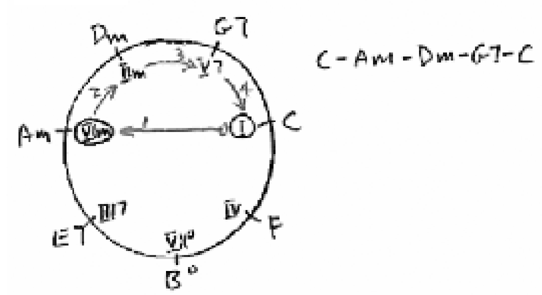
6.10.11
"RETURN TO SENDER" (AND LOADS OF OTHER SONGS THAT USE THE SAME PROGRESSION): A MELLIFLUOUS THIRDS-BASED PROGRESSION

This smooth progression owes its lack of forcefulness to the two consecutive third progressions at its heart, clearly mapped in this Chase chart. In this example, the third progressions are C – Am, and Am – F (Figure 84).

FIGURE 84 Chase Chart of "Return To Sender" (Words and Music by Otis Blackwell and Winfield Scott, 1962); "Blue Moon" (Words by Lorenz Hart, Music by Richard Rodgers, 1934); "Heart And Soul" (Words by Frank Loesser, Music by Hoagy Carmichael, 1938); and a Zillion Other Songs Using This Progression



Variation:



The first version of this progression uses consecutive thirds ... C – Am, followed by Am – F ... which makes the progression sound a bit too predictable and dull.

In the second version, making Dm the third chord in the progression (instead of F) creates three consecutive downward fifths of default chords.

Either way ... C – Am – Dm or C – Am – F... this progression plays it safe.

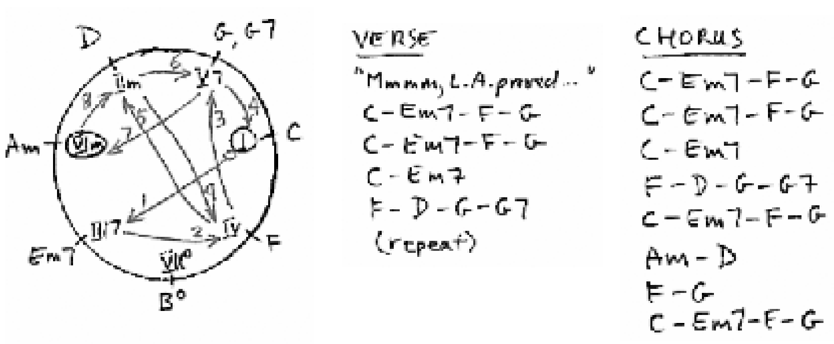
On the other hand, while not vigorous, this progression has much to offer in some songwriting situations. It rolls right along with a stability and inevitability that's well suited to lightweight lyrics. Many 1950s ballads and pop tunes have this progression.

6.10.12 "MIDNIGHT TRAIN TO GEORGIA": TOTALLY AVOIDING FIFTHS UP

The Chase chart of "Midnight Train To Georgia" shows how this unusual progression avoids all fifths up, even fifths up to and from the tonic (Figure 85).

Both the verse and chorus are mapped on a single harmonic scale chart. It's getting a tad cluttered. If you are doing a chart and find it's getting too filled up with arrows, break it up into two or three (or more) separate harmonic scale circles, each showing the chord "map" for a different section of the song. In this example, the Chase chart could well have been broken into two parts, one for the verse, the other for the chorus.

FIGURE 85 Chase Chart of "Midnight Train To Georgia" (Words and Music by Jim Weatherly, 1973)



Although the progression has several fifths down, they do not form chains of three or more (as in the previous example). This preserves their strength while preventing predictability.

The song also features a dynamic, repeating upward second progression (Em7 – F – G), which propels the harmony forward with considerable vigour.

There are even a few third progressions, up and down.

Diversity makes this a powerful chord progression. A good mixture of fifths, thirds, and seconds keeps the harmony interesting while never straying from solid tonality.

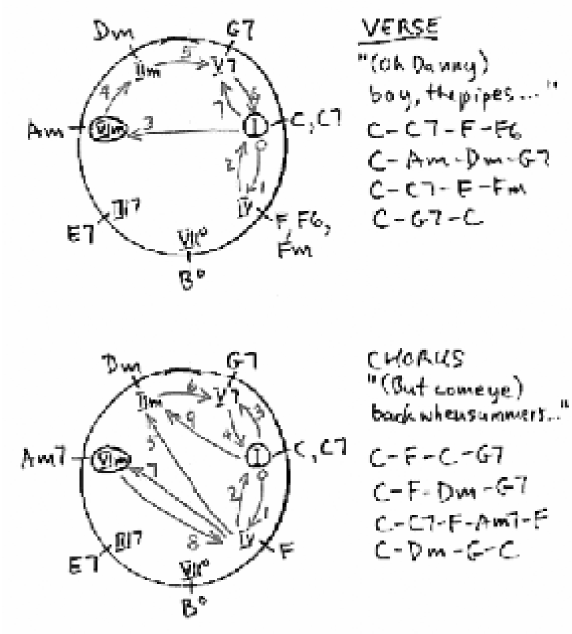
6.10.13
"DANNY BOY": A LITTLE MODE MIXING WITHOUT MODULATING

First, the words and chords:

```
          C                   C7        F       F6
Oh Danny boy, the pipes, the pipes are calling

              C        Am               Dm     G7
From glen to glen and down the mountain side

              C                 C7          F      Fm
The summer's gone and all the flowers are dying

                C       G7             C     (G7)
'Tis you, 'tis you must go and I must bide

              C         F              C      G7
But come you back when summer's in the meadow

             C         F                  Dm     G7
Or when the valley's hushed and white with snow

              C C7      F             Am7      F
'Tis I'll be there in sunshine or in shadow

          C            Dm      G       C
Oh Danny boy, oh Danny boy, I love you so
```

This time, the Chase chart is broken into two parts. The first one maps the verse, the second maps the chorus (Figure 86).

FIGURE 86 Chase Chart of "Danny Boy" (Words by Fred Weatherly, 1913; Music by Rory Dali O'Cahan, ca. 1600)



The Chase chart of "Danny Boy" reveals a good mixture of fifths and thirds, with a brief second progression in the last phrase.

The notable thing about this progression is the smoothness (thanks to the third progressions) with which it integrates chords from the relative minor. The minor chord influence suitably matches the melancholy mood of the lyric.

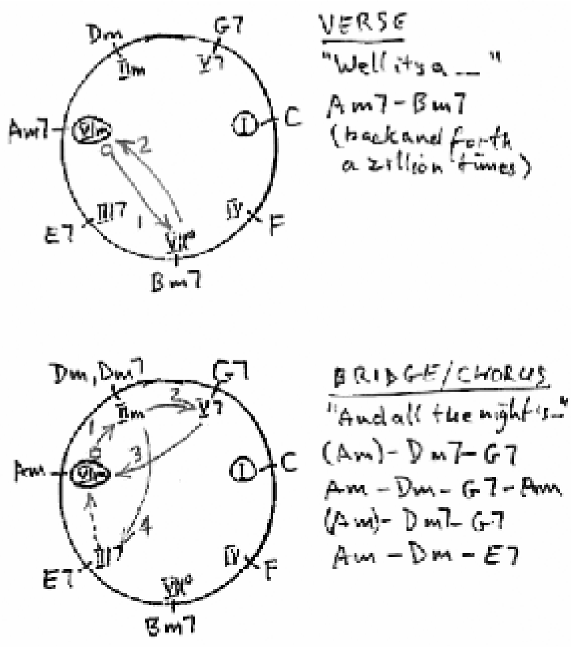
This song goes back to Shakespearean times. The blind Irish harper Rory Dali O'Cahan wrote the tune that became known as "Londonderry Aire." Fred Weatherly, an English lawyer and lyricist, arranged his already-written lyric, "Danny Boy," to fit the tune. The match became one of the world's greatest songs.

6.10.14
"MOONDANCE" A CLASSIC OF THE MINOR MODE

Second progressions and the minor mode combine to make the harmony for "Moondance" distinctive and evocative. The Chase chart reveals that the variant chord VIIm7 (Bm7) replaces the default chord VII° (B°) in the verse.

The progression shuttles between this variant chord and the tonic, itself a variant in the form of a minor seventh (Am7). These two somewhat dissonant minor seventh chords set the mood (Figure 87).

FIGURE 87 Chase Chart of "Moondance" (Words and Music by Van Morrison, 1970)



Then what happens? In the bridge/chorus, the harmony switches over to the *other side of the tonic* (the fifths down side), leaving the VIIm7 chord out of the picture.

The bridge/chorus provides excellent harmonic contrast to the verse. The song remains solidly in the minor mode. The progressions in the bridge/chorus are fifths down and seconds up. No thirds.

6.10.15 "ALL ALONG THE WATCHTOWER": A MASTERPIECE WITH SECOND PROGRESSIONS ONLY

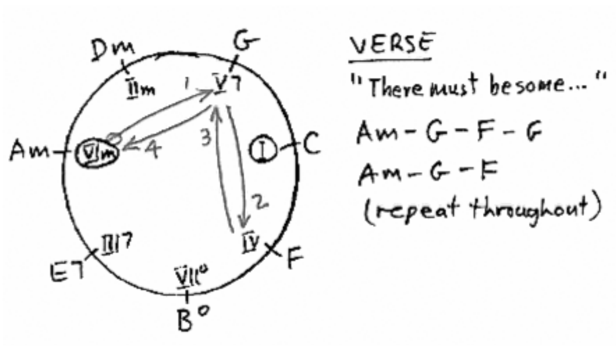
The following discussion refers to the original Dylan recording on the album *John Wesley Harding*, not the more famous (and equally magnificent) Hendrix cover.

This song spends half its time in minor and half in major harmony. But it doesn't really modulate because it does not establish a tonal centre outside of the key of A minor.

The Chase chart of this three-chord song reveals no fifth or third progressions at all—only second progressions. The chords simply move back and forth between A minor (the tonic chord) and F major, via the transient G major chord (Figure 88 below).

The G major chord plays a vital role because, although it serves in a transient capacity only, its presence turns what would otherwise be a relatively weak third progression (Am – F) into a pair of strong second progressions (Am – G and G – F).

FIGURE 88 Chase Chart of "All Along The Watchtower" (Words and Music by Bob Dylan, 1968)



As for harmonic contrast, because the G major chord is transient, as noted, the song spends about half of its time in the minor mode, the other half in major.

With no fifths in sight, the song does not use any form of conventional cadence. It goes on and on restlessly, shifting back and forth, back and forth, major to minor to major to minor, until the song ends on the minor chord, the key's tonic chord.

6.10.16 "I'VE GOT YOU UNDER MY SKIN" A 20-CHORD MASTERPIECE

Now for the other extreme. How in blazes does Cole Porter stuff this exquisitely-wrought three-minute masterpiece with 20—count 'em, *20*— chords without modulating, and without borrowing chromatic chords?

First, an inventory of the chords he uses in "I've Got You Under My Skin." Starting with the major tonic chord and moving clockwise around the harmonic scale, here are all the chords (Table 48):

TABLE 48 Inventory of Chords: "I've Got You Under My Skin"

Nashville Number	Default and Variant Chords			
I	C	CM7	C7	C°
IV	F	Fm	Fm6	
VII°	B	Bm7		
III7	E7			
VIm	Am	Am7	A	A7
IIm	Dm	Dm7		
V7	G	G7	G+	G7♭9

Even though the song has a lot of minor chords, it does not modulate because, by definition, modulation means establishing a new tonal centre. This song does not do that.

The progressions takes quite a few twists and turns, so four harmonic scales are enlisted to map the whole thing (Figure 89 below).

The first harmonic scale in the Chase chart shows that the song begins conventionally enough with a repeating sequence of fifths down. A couple of interesting points:

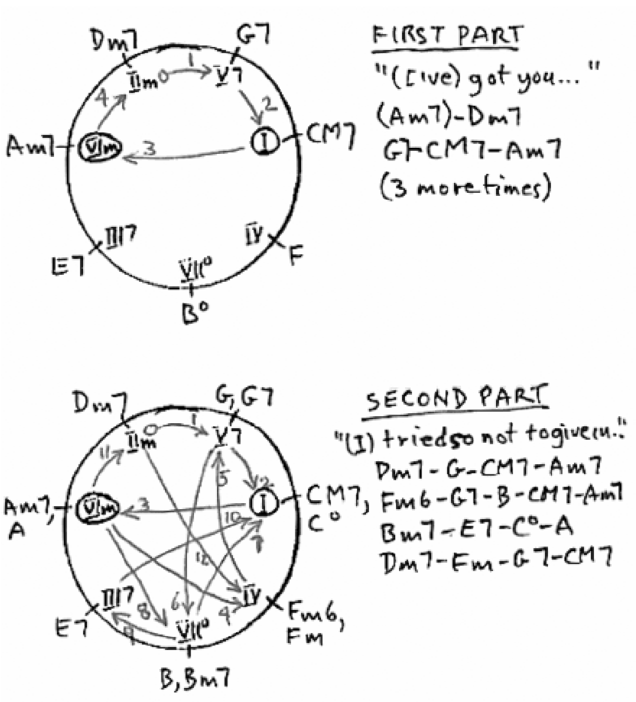
- Porter starts the vocal on the IIm chord instead of the tonic.
- He uses minor *seventh* variant chords in place of minor default chords for added push.

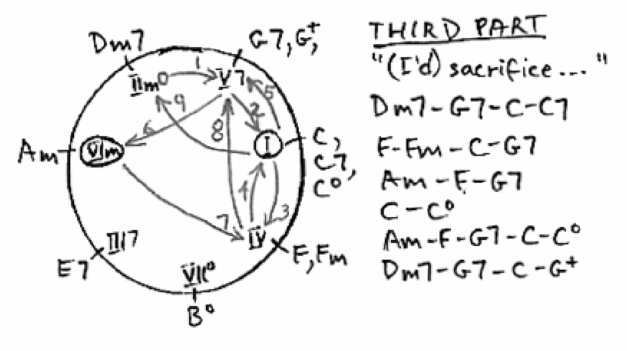
This four-chord progression repeats fours times, firmly establishing tonality.

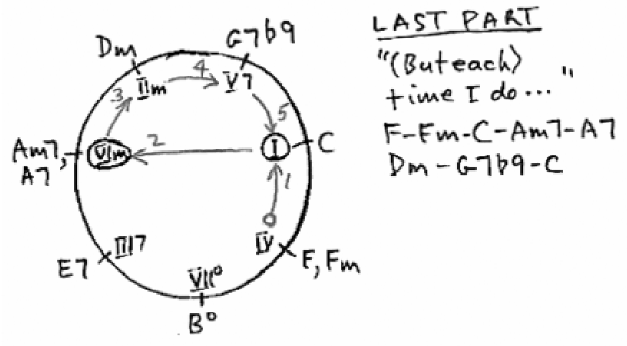
Then, as the Chase chart maps, in the second and third harmonic scales, Porter brings in the other three degrees of the harmonic scale, and simultaneously introduces a lot of variant chords at every harmonic degree except III7 (E7). The effect is a rich harmonic experience without the slightest sense of loss of tonality.

Finally, the song returns to the same cycle of chords it began with (more or less).

FIGURE 89 Chase Chart of "I've Got You Under My Skin" (Words and Music by Cole Porter, 1936)







"I've Got You Under My Skin" makes use of the chords of *all seven degrees* of the harmonic scale—a comparative rarity. Here's another one that does the same thing.

6.10.17
"YESTERDAY": ONE OF THE MOST COVERED SONGS OF ALL TIME

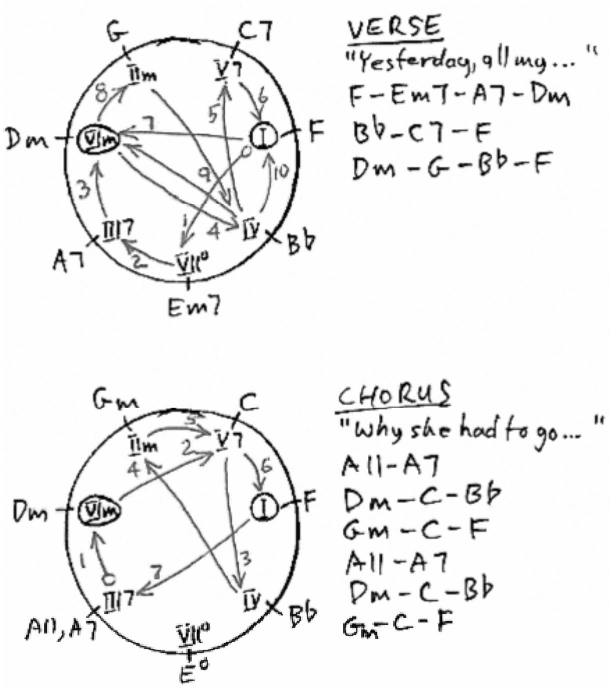
As this Chase chart shows, within the first verse, "Yesterday" goes through all seven harmonic degrees. McCartney uses notable variant chords at two harmonic degrees:

- G major in place of G minor at harmonic degree II;
- Em7 in place of E° at harmonic degree VII.

The minor seventh serves well as a variant of the diminished chord at harmonic degree VII because the minor seventh contains two out of three of the notes of the diminished chord (E° = E, G, B♭; Em7 = E, G, B, D). This is the same variant chord Cole Porter uses in "I've Got You Under My Skin."

It's notable that the first chord change is I – VIIm7, an unusual move. As discussed in "10 Chord Progression Guidelines" at the end of this chapter, movement to any chord from the tonic chord sounds palatable, although it usually happens after tonality is firmly established. Not the case here. (Figure 90 below)

FIGURE 90 Chase Chart of "Yesterday" (Words and Music by John Lennon and Paul McCartney, 1965)



The verse ends with a plagal cadence (IV – I), which is somewhat unusual.

The chords used in this song are just ordinary majors, minors, and sevenths. But chord progression diversity—an interesting mixture of fifths, thirds, and seconds (and a couple of well-chosen variant chords)—makes this tune harmonically interesting.

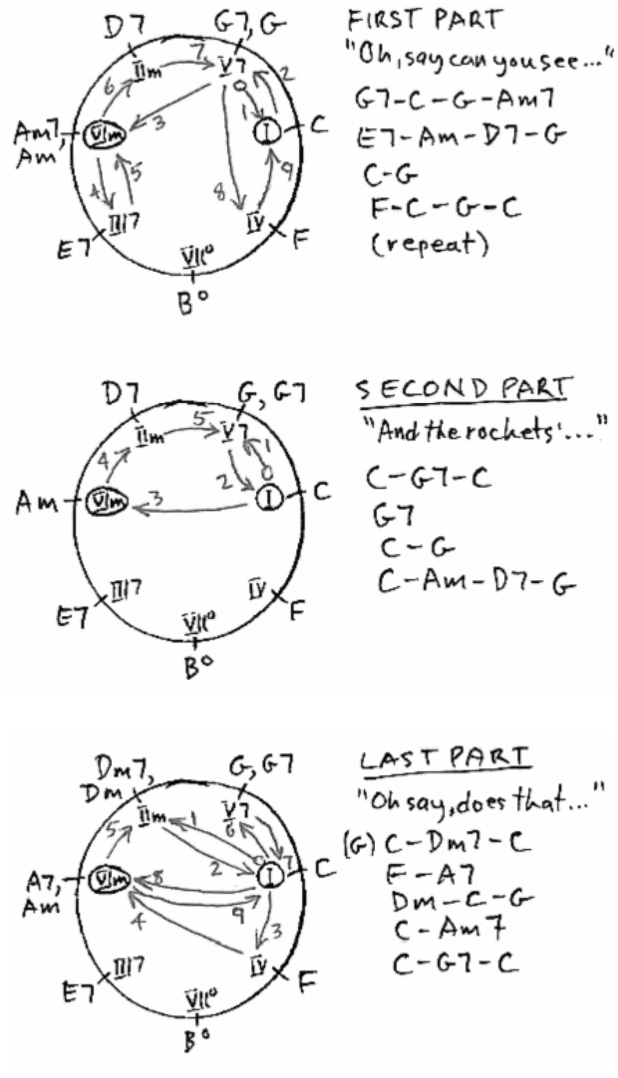
6.10.18
"THE STAR SPANGLED BANNER": A BRITISH TEEN'S GREATEST HIT

Here's the chord progression arrangement used in the Chase chart of "The Star Spangled Banner" (melody composed by John Stafford Smith in his late teens):

```
G7  C       G  Am7 E7      Am       D7  G
Oh say can you see by the dawn's early light

          C          G    F       C          G     C
What so proudly we hailed at the twilight's last gleaming

  G7          C          G     Am      E7       Am   D7   G
Whose broad stripes and bright stars through the perilous fight

          C            G      F       C     G    C
O'er the ramparts we watched were so gallantly streaming

         C  G7    C                    G7
And the rockets' red glare, the bombs bursting in air

       C               G              C   Am   D7    G
Gave proof through the night that our flag was still there

    C    Dm7  C    F         A7 Dm         C    G
Oh say, does that star spangled banner yet wa - ave

          C           Am7          C   G7       C
O'er the land of the free and the home of the brave
```

As discussed in the introduction to modulation in Chapter 5, "The Star Spangled Banner" uses a tonicization or two, but doesn't really modulate (Figure 91).

FIGURE 91 Chase Chart of "The Star Spangled Banner" (Words by Francis Scott Key, 1814; Music by John Stafford Smith, ca. 1768)



As the above Chase chart shows, the strength of the chord progression—derived from an exceptionally well-constructed melody—resides in its robust seconds and descending fifths.

Third progressions appear only briefly.

6.11 Examples: Chase Charts of Great Songs without Modulation, with Chromatic Chords

6.11.1 Group 2: List of Great Songs without Modulation, with Chromatic Chords

A chromatic chord—a chord whose root lies outside the harmonic scale for the key of the song—introduces harmonic variety that attracts your brain's attention.

Chase charts of the following classic songs, all selected from the GSSL, will show you how great songwriters make use of chromatic chords:

- "Hey Jude"
- "Carefree Highway"
- "Wild Horses"
- "September Song"
- "Crazy"
- "Trouble In Mind"
- "Sundown"
- "I Heard It Through the Grapevine"
- "Bridge Over Troubled Water"

In some of the examples, the first chord in a chromatic progression is the tonic chord (Table 49).

TABLE 49 Songs with Chromatic Progressions Where the First Chord Is the Tonic

Chromatic Progression	Song Title
I – ♭VII – I	"Trouble In Mind"
I – ♭VII – IV	"Hey Jude" "Carefree Highway" "Wild Horses"
I – ♭VII – V7	"Sittin' on the Dock of the Bay"
I – ♭II – I	"It Was a Very Good Year"
I – ♭VI – I	"September Song"
I – ♭II – II	"Georgia On My Mind"

In others, the first chord in a chromatic progression is not the tonic chord (Table 50).

TABLE 50 Songs with Chromatic Progressions Where the First Chord Is Not the Tonic

Chromatic Progression	Song Title
II – ♭II – I	"Girl From Ipanema"
III7 – ♭II – IIm	"Georgia On My Mind"
IV – ♭VII – IV	"Bridge Over Troubled Water"
IV – ♭VII – I	"Trouble In Mind" "Sundown"

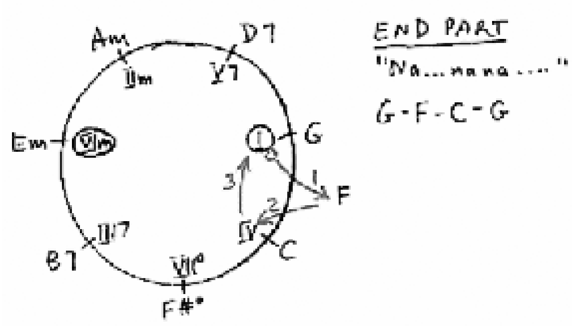
6.11.2 "HEY JUDE": NAAA-NA-NA NA-NA-NA-NA FOR SEVERAL MINUTES

If you're going to use a chromatic chord (or more than one chromatic chord) in a song, it's vital to firmly establish tonality first. Otherwise your poor brain will have a tough time trying to figure out what key the song's in.

Also, for the same reason (hanging on to tonality), it's a good idea to return to the harmonic scale soon after borrowing a chromatic chord.

The first part of "Hey Jude" uses conventional harmony that firmly establishes tonality, so the Chase chart below omits it. However, the last part, the "na-na-na-na" part, which goes on for several minutes moves outside of the harmonic scale and grabs the ♭VII chord (F major in the example below, Figure 92).

FIGURE 92 Chase Chart of "Hey Jude," Last Part (Words and Music by John Lennon and Paul McCartney, 1968)



The chromatic chord lasts only one slow bar (the second bar) of each four-bar "na-na-na-na" chorus. But, from a harmonic perspective, it's that chromatic chord that grabs the listener's ear.

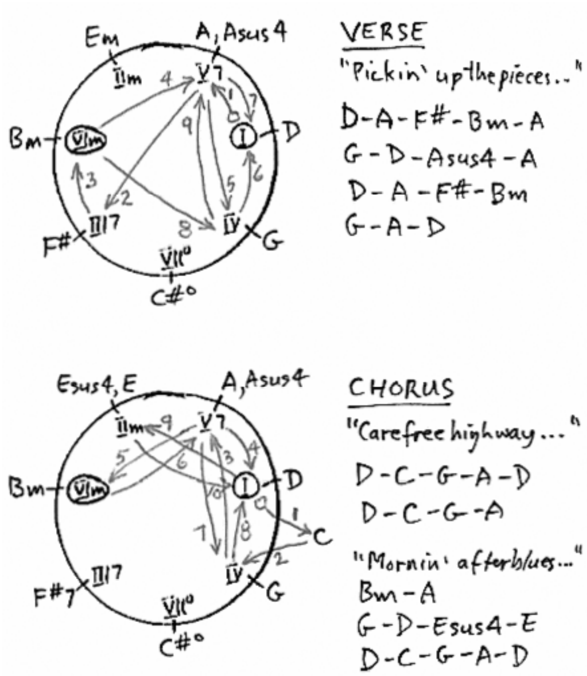
In a Chase chart involving a chromatic chord, you might wonder where exactly to put the chromatic chord (the chord F major in the above example). It goes *outside* the harmonic circle, but there's no hard and fast rule as to exactly where. For visual clarity, the best place is right between the chord at which the progression exits the key (the exit chord is G major in the above example) and the chord at which the progression returns to the key (the return chord is C major in the above example).

6.11.3
"Carefree Highway": Slippin' Away on a Chromatic Chord

The Chase chart below (Figure 93) reveals that Lightfoot uses conventional chords and chord progressions in the verse of "Carefree Highway," firmly establishing tonality.

In the chorus, however, he reaches outside the harmonic scale for the same ♭VII chord that McCartney uses in "Hey Jude." The chromatic chord, C major in this example, sticks right out and grabs the ear.

FIGURE 93 Chase Chart of "Carefree Highway" (Words and Music by Gordon Lightfoot, 1974)



Wisely, Lightfoot brings in the chromatic chord for only one bar in each phrase in which it appears. Tonality remains firm.

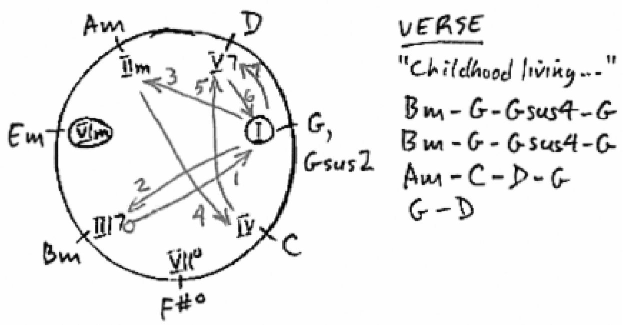
6.11.4 "WILD HORSES": UNUSUAL USE OF MINORS

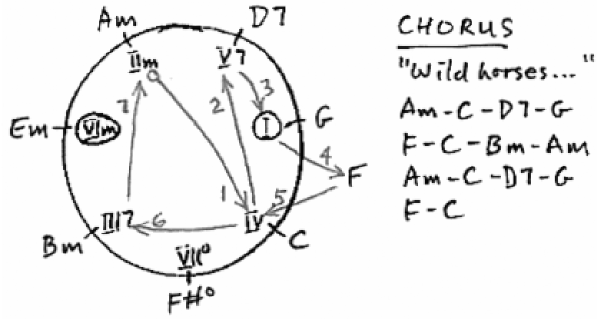
You will recognize this as the song Sadie and Ellie Sue pipe through the sound system over at the Dodge City Horse Store.

Even though the song is solidly in the major mode, the vocal of the verse begins on a minor chord.

As the Chase chart below reveals (Figure 94), the chord progressions in both the verse and the chorus eschew the tonic of the relative minor (Em) while incorporating the other two minor chords. This gives the progression a truly distinctive sound.

FIGURE 94 Chase Chart of "Wild Horses" (Words and Music by Mick Jagger and Keith Richards, 1970)





As if that weren't enough, in the chorus, the progression grabs the same ♭VII chromatic chord used in "Hey Jude" and "Carefree Highway." In this case, being in

the key of G, the chromatic chord is F major (on the words "drag me"). An elegant, attention-getting touch.

As with the other two songs, the progression visits the chromatic chord only briefly, then returns to the chords of the harmonic scale.

6.11.5 "SEPTEMBER SONG": HOW TO USE MORE THAN ONE CHROMATIC CHORD

In his poignant, brilliant "September Song," Kurt Weill uses many chords, 12 in all, of which two are chromatic chords (Figure 95).

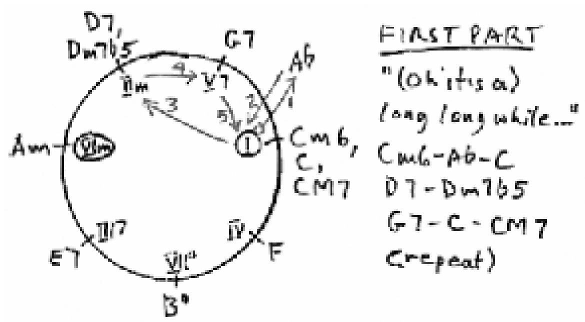
He also uses four variants of the tonic: C, CM7, Cm, and Cm6.

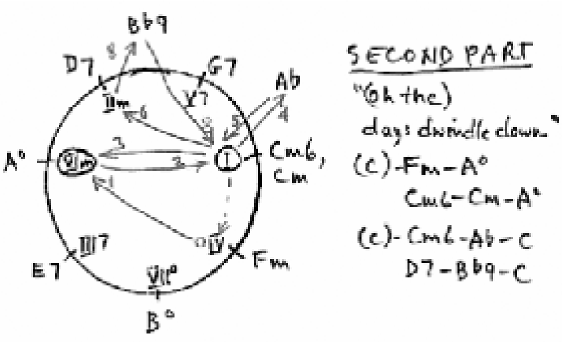
By using two minor-chord variants of the tonic (Cm6 and Cm), "September Song" flirts with modulation to the parallel key of C minor. The wistful, sad lyric matches the harmonic progression perfectly.

One of the two chromatic chords may be found in the first section, near the beginning of the song. This harmonic direction has the potential to threaten tonality.

However, the progression then quickly moves to a V7 – I perfect cadence (G7 – C), ensuring the ear knows the true harmonic centre, despite the presence of the chromatic chord (A♭).

FIGURE 95 Chase Chart of "September Song" (Words by Maxwell Anderson, Music by Kurt Weill, 1938)





The second chromatic chord appears in the second section, only briefly, near the end of the song. In both cases, the chord following the chromatic chord is the tonic C major.

One other interesting point about the "September Song" chord progression: the second part of the song uses only second and third progressions—no fifths.

In the olden days (first half of the 20th Century), many songs had a so-called "verse" followed by a "refrain." These terms had different meanings from what everybody now thinks of as "verse" and "refrain". The old-style verse was a long introduction or narrative, a story with its own melody. It was typically sung only once. Then came the refrain.

Over time, singers and audiences tended to neglect the verse and get straight to the refrain. Often, singers would not even bother singing the verse. Eventually, the old-style verse got dropped and the so-called refrain became what everyone considered the whole song.

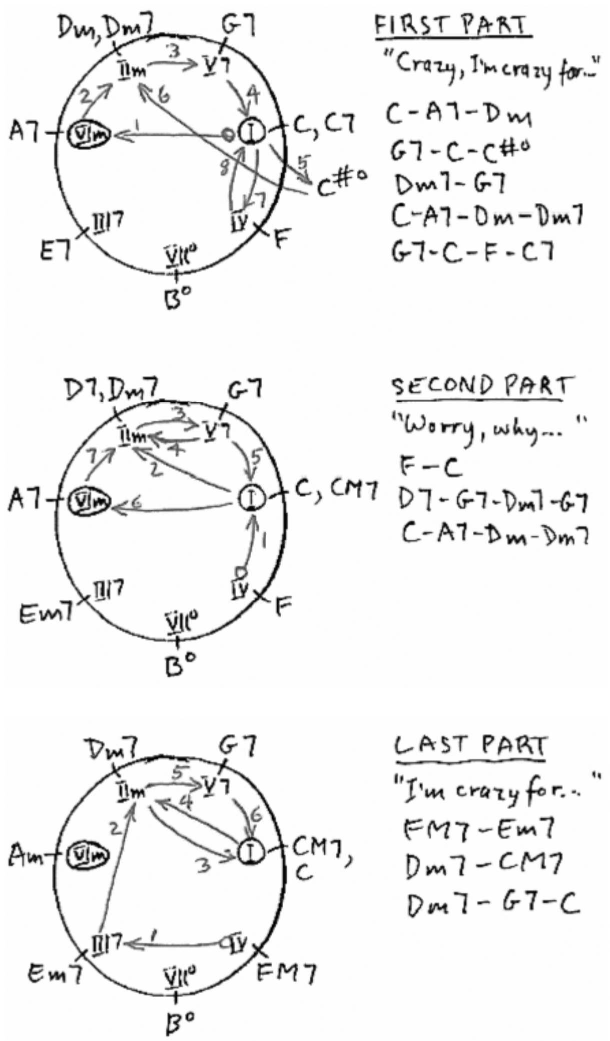
"September Song," written so long ago, has a particularly affecting old-style verse that you don't hear too often. Listen to the Frank Sinatra recording of "September Song." He does both verse and refrain, and tears your heart out.

6.11.6 "CRAZY": WHEN THE TEMPO'S THIS SLOW, YOU NOTICE EVERY CHORD

The chromatic chord in this song makes its appearance in the instrumental turnaround after the second phrase. You'd hardly notice the C♯° chord if the tempo weren't so slow.

But, as the Chase chart below shows (Figure 96), the chord does catch the ear as the middle part of a chromatic second progression, C – C♯° – Dm7.

FIGURE 96 Chase Chart of "Crazy" (Words and Music by Willie Nelson, 1961)



Like many country songs ("Walking After Midnight," for example), the second part of "Crazy" starts on the IV chord, (F major in this example) for the sake of contrast.

The Chase chart above shows that second and fifth progressions predominate for most of this song.

The last part of the song has a long run of seconds: FM7 – Em7 – Dm7 – CM7 – Dm7.

THAT STUPID MIDNIGHT PLANE TO HOUSTON

Willie Nelson claims his original title for "Crazy" was "Stupid."

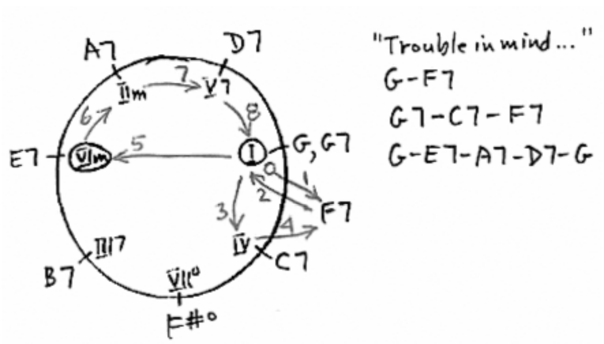
Jim Weatherly's original title for "Midnight Train To Georgia" was "Midnight Plane To Houston"!

6.11.7 "TROUBLE IN MIND": MORE SECONDARY DOMINANTS

Like "September Song," the blues classic "Trouble In Mind" moves to a chromatic chord from the tonic, right off the top. But then it moves directly back to the tonic (Figure 97).

A few bars later, the same chromatic chord pokes up again, as a transient chord.

FIGURE 97 Chase Chart of "Trouble In Mind" (Words and Music by Richard Jones, 1926)



"Trouble in Mind," like so many blues tunes, gets its harmonic drive from its almost exclusive use of tritone-unstable seventh chords, including a run of secondary dominant sevenths: E7 – A7 – D7.

Even the chromatic chord is a seventh (F7).

6.11.8
"SUNDOWN": SLIPPIN' AWAY ON THE "CAREFREE HIGHWAY" IN REVERSE

In "Carefree Highway," Lightfoot uses this chromatic progression:

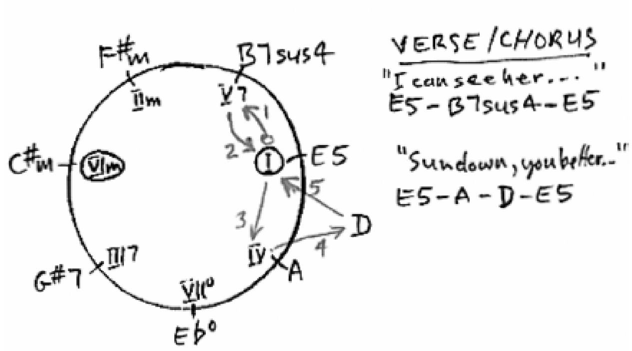
I – ♭VII – IV

In "Sundown," as the Chase chart below reveals (Figure 98), he reverses the direction of the same chromatic progression:

IV – ♭VII – I

The particular ♭VII chord in this case is the chord D major.

FIGURE 98 Chase Chart of "Sundown" (Words and Music by Gordon Lightfoot, 1974)



As with "Carefree Highway," the chromatic chord (found, again, in the chorus) is the essential attention-getting harmony in "Sundown."

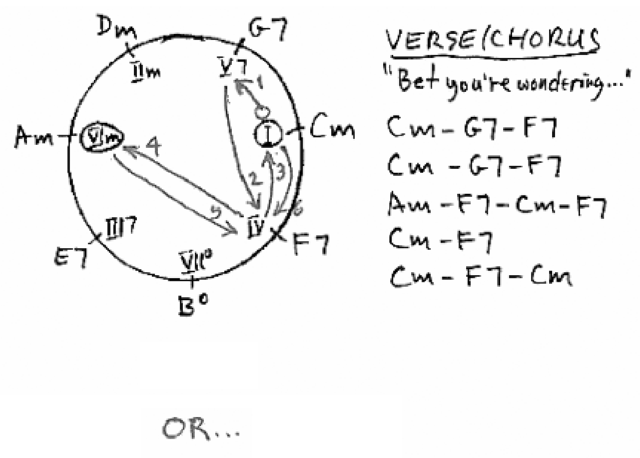
6.11.9 "I HEARD IT THROUGH THE GRAPEVINE": FOUR-CHORD INGENUITY

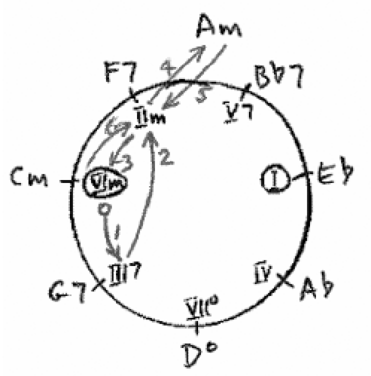
The Chase chart below (Figure 99) maps two possible interpretations of the chord progression for this song:

1. The song is in a major key, C major in this example, but uses the tonic of the parallel minor key (Cm) as a variant chord. All three of the other chords are normal for the major key, except that the chord F is replaced with F7, a common variant.

2. The song is in a minor key, C minor, but uses a seventh variant containing a major third (F7) in place of the default minor subdominant chord (Fm, which has a minor third). In this interpretation, the progression also uses a chromatic chord (Am).

FIGURE 99 Chase Chart of "I Heard It Through The Grapevine" (Words and Music by Norman Whitfield and Barrett Strong, 1967)





From a melodic standpoint, the minor third interval relationship with the tonic means the song is clearly in a minor mode. So the second of the above two interpretations is technically more correct, even though the first interpretation is harmonically simpler in that it does not have a chromatic chord.

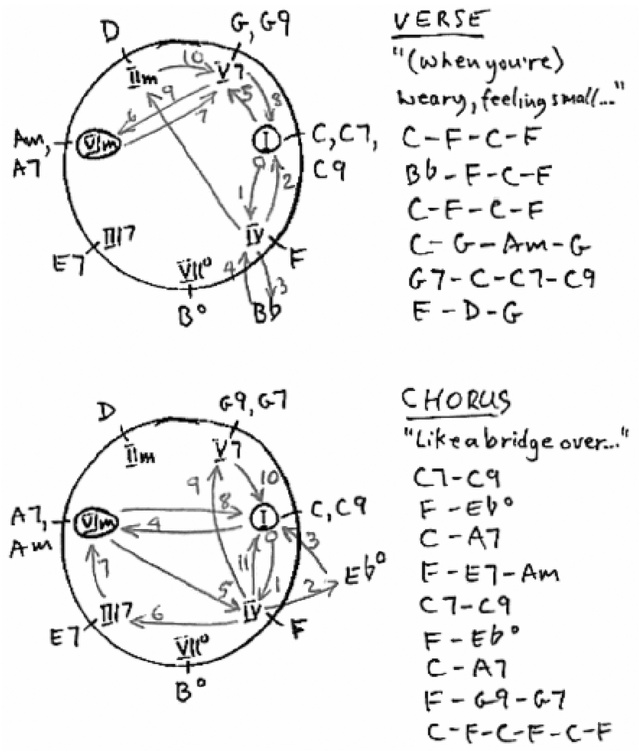
Either way you care to interpret this chord progression, it's ingenious and ear-grabbing. No fancy extended chords. Just two ordinary seventh chords and two ordinary minor chords.

6.11.10 "BRIDGE OVER TROUBLED WATER": HARMONIC HEAVEN AND HELL

The verse of this Paul Simon classic has a lot of plagal "amen" (IV – I) cadences, perhaps in keeping with Simon's direction to play it "like a spiritual."

The chorus, on the other hand, has lots of *diabolus in musica* tritone harmony in the form of sevenths, ninths, and diminished chords (Figure 100).

FIGURE 100 Chase Chart of "Bridge Over Troubled Water" (Words and Music by Paul Simon, 1970)



For the most part, the harmony's pretty conventional: lots of descending fifths and a smattering of seconds and thirds.

However, the verse and chorus each borrow one chord from outside the key.

- In the verse, it's good ol' versatile ♭VII (the chord B♭ on the word "tears").
- In the chorus, it's a rootless diminished chord (E♭° on the word "over").

The song owes its harmonic richness in part to the large number of chords (13 in all), uncommon in a song that does not modulate.

Speaking of modulation, here comes a short course.

6.12
Modulation Ways and Means

6.12.1
MODULATION: THE SOUL OF THE WESTERN TONAL SYSTEM

Modulation is the single most extraordinary and musically potent aspect of the Western tonal system of 12 major keys, 12 minor keys and equal temperament.

As discussed near the end of Chapter 5, modulation means changing the key, moving the tonal centre within a piece of music.

Too bad most songwriters don't know how to exploit the capacity for modulation. It's one of many reasons they turn out boatloads of unforgivably monotonous tunes.

Modulation enables limitless harmonic and melodic variety while preserving unity. A successful modulation provides the brain with a new orientation of tones and chords, a leap into a musical parallel universe. Adventure! Danger! Thrills! Or ... at least musical novelty. Like taking the morning stagecoach to Wichita. Or Amarillo (that's where a bounty hunter shot "Running Gun" Marty Robbins for neglecting to modulate).

Making the transition from the original tonality (key) to a new one usually takes from a couple of bars to a full four-bar phrase. Songwriters who know how to modulate will often change keys at a natural sectional boundary, such as the end of a verse, going into a bridge or chorus. At the end of the contrasting section, tonality moves back to the original key.

If the tonality does not move back to the original key, you probably have a *shift modulation*, a decidedly distasteful way of moving tonality (see below).

6.12.2
NEAR VS REMOTE MODULATION

If a song modulates to a closely-related key (a key that shares many of the same scale notes and chords with the original key), it's called a *near modulation*.

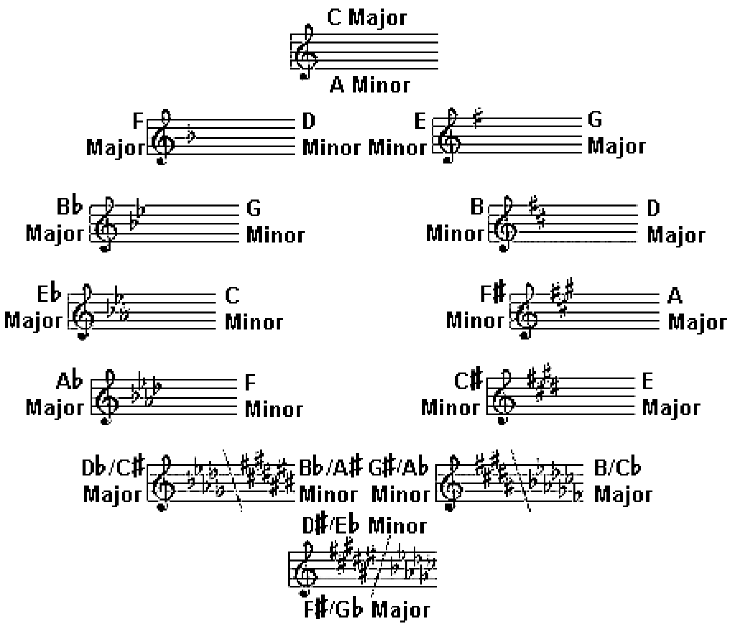
If the tune modulates to an unrelated key (a key that shares few of the same scale notes or chords with the original key), it's called a *remote modulation*.

If it modulates to a key that's neither remote nor near, it's called ... um ... a *moderately distant* modulation. Or something.

To get an idea of what's considered "near" or "remote," have a look at Heinichen's Circle of Fifths (Figure 101). Pick a key, any key. Whatever key you pick is closely related to other nearby keys in the Circle of Fifths. For example:

- The key of D major is "near" such keys as B minor, G major, E minor, A major, and F♯ minor.
- The key of D major is "remote" from keys on the other side of the Circle of Fifths, such as the keys of A♭ major, F minor, E♭ major, C minor, C♯ major, and B♭ minor.
- The key of D major is "moderately" related to keys such as F major and D minor. (Even though the keys D major and D minor share the same tonic note, they use significantly different scales, so they're only "moderately" related).

FIGURE 101 Heinichen's Circle of Fifths



In general, regardless of the method of modulation, you absolutely must establish tonality firmly in the original key before modulating to another key. Otherwise, confusion reigns. You establish the original key by using the I, IV, and V7 chords at the outset of a tune. Simple triads and dominant seventh chords serve as the most useful chord types in establishing and supporting an initial tonal centre.

In the new key, you need at least one cadence (especially V7 – I, where I is the new tonic chord) to clearly confirm or validate the new tonality. Otherwise your brain assumes it's only a *possible* shift in tonality, a *transient* modulation.

If you use jazzy, extended chords from the outset, such as 11th chords or suspended chords or 13th chords, you will find it harder to establish tonality (at least in the collective mind of your audience—regardless of whether you think you've succeeded in establishing a tonal centre). And you'll find it even more difficult to successfully modulate.

It's not always easy to modulate to a nearby key. You can, for example, easily modulate from the key of C major to its relative minor, the key of A minor, and vice-versa, because the modes differ: major and minor keys sound way different, even if they share the same scale notes.

However, if you're modulating between closely-related *same-mode* keys, such as C major to G major, it's easy to lose the sense of tonality because the two keys share not only the same mode, but also most of the same chords and most of the same scale notes. So, if the harmony and melody don't clearly emphasize the key, the brain asks itself, "Which key am I in, G major or C major?" and wanders off in confusion to find a better song.

Modulating to a remote key stands out to a greater degree than modulating to a nearby key. Remote keys have few chords and scale notes in common (for example, the key of D major and the key of C minor). Your listener's brain senses fresh new harmonic territory and stays interested.

Here are some modulation ways and means.

6.12.3
RELATIVE KEY MODULATION

In relative key modulation, the song establishes tonality in a major key (such as C major), then moves to its relative minor (A minor) and establishes tonality there. Or vice-versa.

NOTE: A large proportion of popular songs have a casual mix of major and relative minor chords. But casual use of relative minor or relative major chords in a song that does not actually establish tonality in the relative key does not constitute relative key modulation.

Chase-charted examples of relative key modulation coming up:

- "Dear Landlord"
- "Lovesick Blues"
- "Georgia On My Mind"

6.12.4 PARALLEL KEY MODULATION

In parallel key modulation, the song establishes tonality in a major key (such as C major), then moves to its namesake minor, C minor, and establishes tonality there.

Or vice-versa.

Chase-charted examples of parallel key modulation coming up:

- "Kaw-liga"
- "It Was A Very Good Year"

6.12.5 SHIFT MODULATION (DON'T DO THIS!)

Shift modulation is the most common and most abused technique of changing keys.

Typically, a shift upwards occurs near the end of a song to create a contrast with the rest of the song. For example, the song starts off in, say, the key of C. Then, for the last verse or chorus, tonality shifts upwards to the key of D. Why? Because an increase in pitch is exciting (recall "Emotional Effects of Pitch" near the end of Chapter 3).

The hallmark of shift modulation is that the song almost always does not return to the original key, as is the case with other kinds of modulation. Ballad-like songs sometimes shift-modulate to relieve monotony.

It's not uncommon for a songwriter to write a song in a single key, only to have an *arranger* introduce a shift modulation (without authorization) for some artist covering the song. In such a case, the shift modulation is called an "arranger's modulation."

In some recordings, shift modulation occurs multiple times. For instance, the song starts in the key of C major, then shifts up to D, then up to E, and so on, once every verse or two.

Here are a few songs with shift modulation:

- "And I Love Her" (The Beatles)
- "Fever" (Peggy Lee recording)
- "My Generation" (The Who)

- "Soul Man" (Sam & Dave recording)
- "You Are The Sunshine Of My Life" (Stevie Wonder)

Great songs, aren't they?

But wait.

Shift modulation has a problem. It was relatively novel up to the 1950s and 1960s. But since then, it has been done to death.

Shift modulation is the easiest way to change keys. Even a complete dolt of a songwriter or arranger can shift modulate. Consequently, that's exactly what has happened over time.

Today, shift modulation is the mark of a rank amateur.

Don't do it.

Well ... don't do it unless you have a good reason, or you *really* know what you're doing.

Here are two examples of shift modulation done well, both by the great Johnny Cash (and both, incidentally, from the 1950s, when the technique had not yet been completely abused):

- ***"Five Feet High And Rising"*** ... In this tune, Cash keeps shifting the tune upward with each verse to match the ever-rising flood waters in the song's lyrics. "Two feet high and rising ... Three feet high and rising ... Four feet high and rising ... "

- ***"I Walk The Line"*** ... In the original recording of this song, here's what Cash does:

    - Starts in the key of F, then
    - Shifts down a fifth to B♭, then
    - Shifts down a fifth to E♭, then
    - Shifts back up a fifth, returning to B♭, then
    - Shifts back up a fifth again, returning to F, ending the song in the original key.

    (No doubt, the guitar players at the recording session had capos on the first fret and were playing the chords, E, A, and D, instead of F, B♭, and E♭, respectively.)

    But here's the kicker: The second time Cash sings the tune in F, he sings the melody a *full octave lower* than the first time in F. The words are identical in the two F-key verses, creating a striking contrast. Overall, it's a masterful piece of arranging. Within this song, Cash's singing range is two octaves plus a major second.

TRUCK DRIVER'S GEAR CHANGE HALL OF SHAME

Shift modulation has become such a horrible cliche that there's a website dedicated to exposing recordings of shift modulation. The website is called **The Truck Driver's Gear Change Hall of Shame**, so named because shifting gears while driving a truck is an apt metaphor for this type of modulation.

Before you consider writing another Truck Driver's Gear Change song, you may want to check out the website: www.GearChange.org

6.12.6 SEQUENTIAL MODULATION

In sequential modulation, a melodic phrase or a configuration of chords (or both) repeats at a different pitch to bring about a modulation, which eventually returns to the original key.

Several chords of the same type can be used palatably, such as C - D - E - F♯ (sequence of major seconds). Or chords of the same type can progress along a scale: Gm7 - Fm7 - Em7 - Dm7 - Cm7 (C minor scale).

Chase-charted examples coming up:

- "It Was a Very Good Year"
- "The Girl from Ipanema"

6.12.7 PIVOT CHORD MODULATION

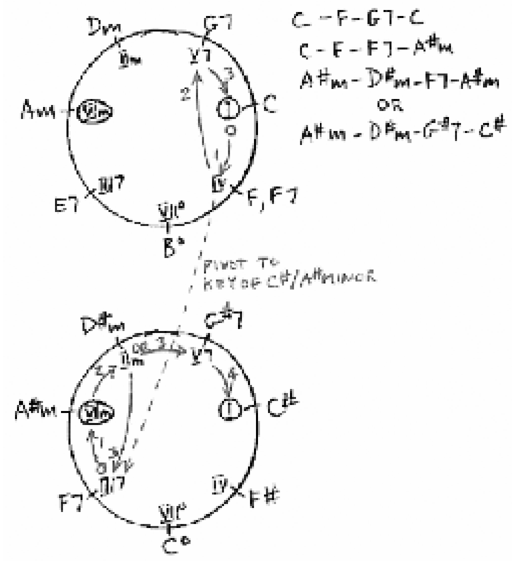
A pivot chord is a chord that's common to both the prevailing key and the key to which tonality eventually moves. For example, the chord F major is common to both the key of F major (the tonic chord) and the key of C major (the IV chord). So F major can be used to "pivot" out of the key of C major and into the key of F major.

Figure 102 (below) shows an example of using a pivot chord to modulate to a remote key and back again (no particular song, just a generic example).

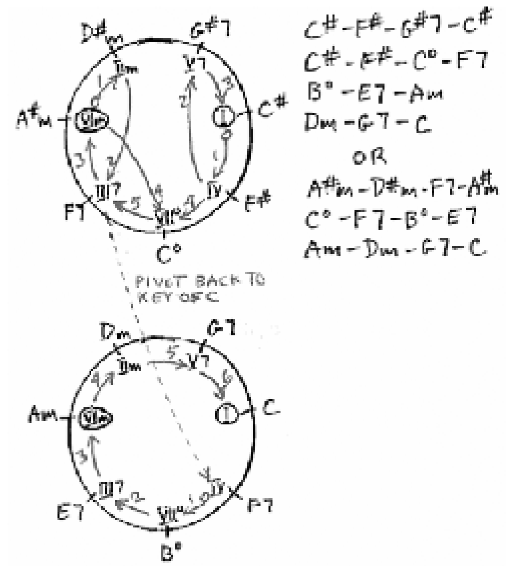
In this example, the original key is C major. The remote key is C♯ major / A♯ minor. The pivot chord is F in the original key and F7 in the remote key.

FIGURE 102 Chase Chart: Using a Pivot Chord to Modulate to a Remote Key

Pivot from key of C major to key of C# major ...



Pivot from key of C# major back to key of C major ...



Two keys, no matter how unrelated, will always have at least two chords that share the same root note (usually more than two chords). You can use these chords as pivot chords.

You can often exploit the diminished chord for pivot potential. The diminished chord has equal-sized minor third intervals, so, technically, it has no root. Therefore, it repeats itself every three semitones (see Figure 103 below). Since it's so unstable, you can use it to take a number of different harmonic paths.

(Also, as noted earlier, the VIIm can sometimes substitute for VII°, as these chords have two notes in common.)

FIGURE 103 Chase Chart: The Versatile Diminished Chord

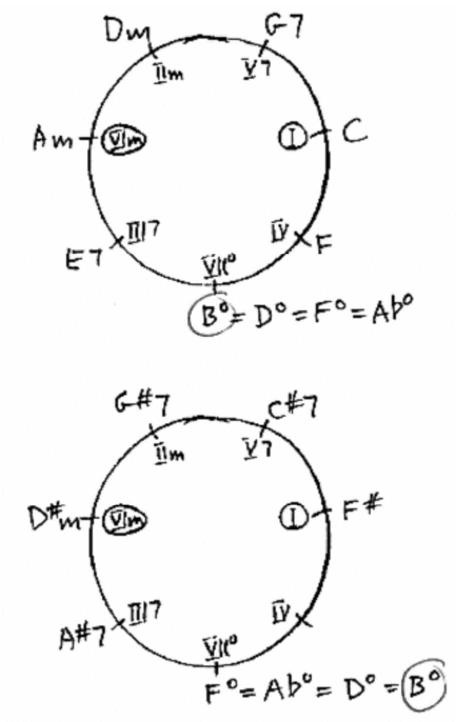
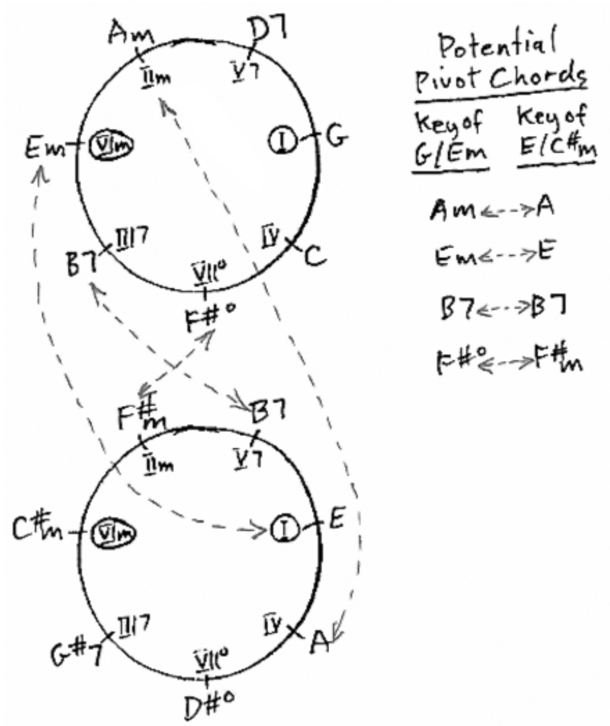


Figure 104 below shows the potential pivot chords for two keys that are moderately closely related: the key of G / Em and the key of E / C♯m.

FIGURE 104 Chase Chart: Potential Pivot Chords, Modulation to a Moderately Close Key



Chase-charted examples of songs using pivot chords coming up:

- "I Got Plenty O' Nuttin'"
- "Three Bells (Jimmy Brown Song)"
- "Kodachrome"
- "Dear Landlord"
- "One Fine Day"

6.13 Examples: Chase Charts of Great Songs with Modulation, without Chromatic Chords

6.13.1 GROUP 3: LIST OF GREAT SONGS WITH MODULATION, WITHOUT CHROMATIC CHORDS

Here are some songs from the *Gold Standard Song List* that modulate without employing the Truck Driver's Gear Change. All of theses songs return to the original key, and none borrow chords from outside the prevailing tonality.

- "I Got Plenty O' Nuttin'"
- "Three Bells (Jimmy Brown Song)"
- "Kodachrome"
- "Dear Landlord"
- "One Fine Day"
- "Free Man In Paris"
- "Kaw-liga"
- "Lovesick Blues"
- "Gimme Shelter"

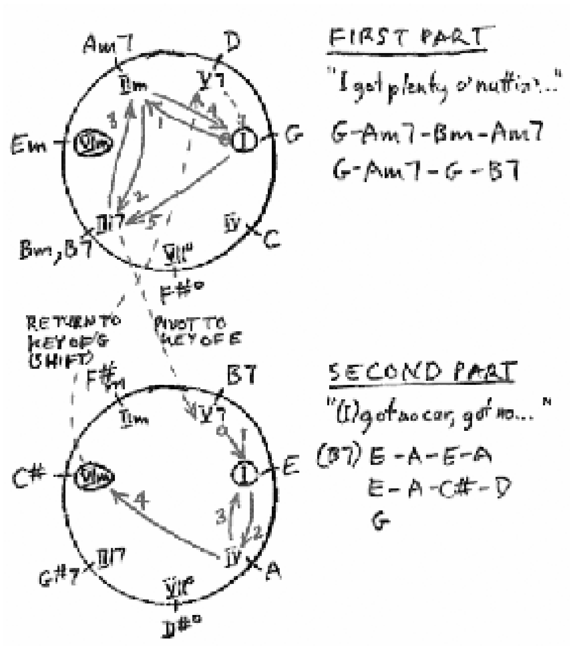
6.13.2 "I GOT PLENTY O' NUTTIN'": TWO KINDS OF MODULATION

The Chase chart below (Figure 105) reveals that this song starts with a series of strong second progressions.

Then Gershwin uses the B7 chord common to the keys of G major (actually its relative minor, E minor) and E major to pivot to the key of E major.

Then, to get back to the key of G major, he employs a transitory shift, from the variant chord C♯ major (in place of the default chord, C♯ minor) in the key of E major up to D major, the dominant chord of the key of G.

FIGURE 105 Chase Chart of "I Got Plenty O' Nuttin'" (Words by Du Bose Heyward and Ira Gershwin, Music by George Gershwin, 1935)



The E – A – C♯ – D – G progression sounds perfectly palatable to the ear because Gershwin uses chords of the same type—all major triads.

6.13.3 "THE THREE BELLS (THE JIMMY BROWN SONG)": PIVOTING TO A CLOSELY RELATED KEY

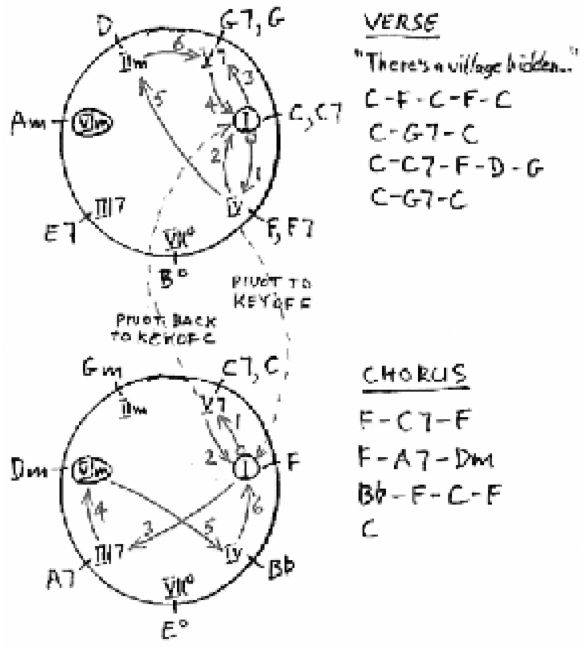
Related keys are keys that have many scale notes and chords in common. As mentioned earlier, you can run into trouble modulating to a closely related key if you

don't know what you're doing. Your audience could start to wonder what key you're in.

This French beauty, "The Three Bells," makes it all sound so natural.

Two of the chords that the keys of C major and F major have in common are their namesake chords, C major and F major. Beginning in the key of C major, this song uses the chord F major to pivot to the key of F, and the chord C to pivot back to the key of C (Figure 106 below).

FIGURE 106 Chase Chart of "The Three Bells (The Jimmy Brown Song)" (Original French Words by Bert Reisfeld, English Words by Dick Manning, Music by Jean Villard, 1945)



For the sake of maintaining tonality, the progression makes emphatic use of the dominant seventh chord in each key.

There's another reason this song so smoothly shifts tonality between the keys of C and F. There is a pronounced tempo change between the verse and the chorus. This sharp delineation makes it even easier for the ear to accept that the verse and chorus inhabit separate tonal worlds.

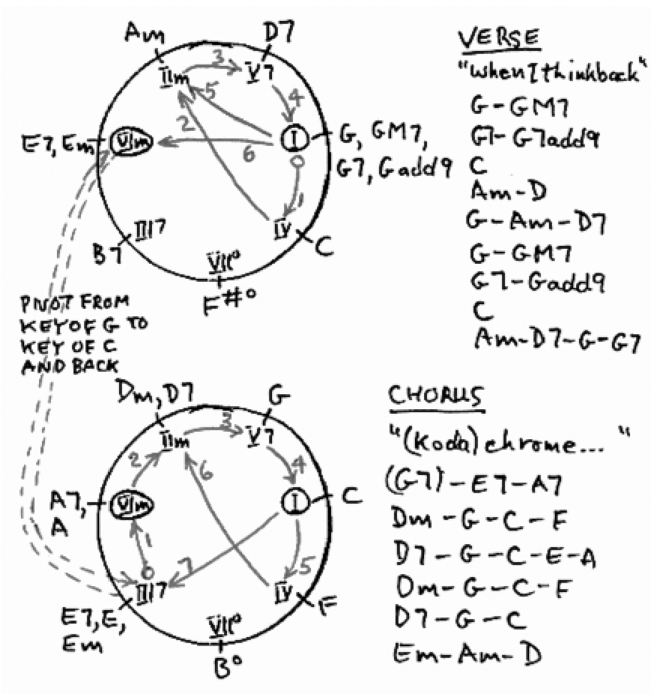
6.13.4
"KODACHROME": USING THE SAME CHORD (ROOT) TO PIVOT BOTH WAYS

In "Kodachrome," Paul Simon uses the variant chord E7 in place of Em in the key of G to pivot to the closely-related key of C, its harmonic scale neighbour.

In the new key, he uses a lot of consecutive descending fifths to keep the progression moving forward powerfully, and to maintain tonality in the new key.

Then he uses E minor to pivot out of C and back to G, again using descending fifths to re-establish the original key (Figure 107).

FIGURE 107 Chase Chart of "Kodachrome" (Words and Music by Paul Simon, 1973)



The song returns to the original key for the second verse, then modulates to the "chorus key" and stays there. The song ends without returning to the original key.

WHAT MAKES "ORANGE BLOSSOM SPECIAL" SO DANG SPECIAL?

Every time there's a hoedown on the main street of Dodge, Ellie Sue picks up her fiddle and plays "Orange Blossom Special" for 60 to 90 minutes straight, with Sadie on washboard, Doc Yada-Yadams on jug, Marshal McDillon on musical saw, Deputy Fester on guitar, and two mules from the Dodge City Horse Store on kazoo and gut-bucket bass. The citizenry dances up a storm and Ellie Sue's nostrils and eyes get wilder and wilder and eventually she starts frothing at the mouth. At that point, Doc Yada-Yadams calls a halt to the song and performs a quick bit of neurosurgery on Ellie Sue to bring her back to normal. That's the way it always plays out. So now everybody considers "Ellie Sue's Orange Blossom Special" a bona fide Dodge City tradition.

What is it about that song that causes some otherwise perfectly respectable folks to go plum loco?

"Orange Blossom Special" makes use of two musical devices not often found together in a country song:

- A long vamp on a single chord over which a fiddler improvises; and
- Modulation to a closely related key.

The instrumental and vocal versions are somewhat different.

Instrumental Version

The tune typically starts out in the key of E with a fiddle solo over a *vamping* tonic chord. This goes on for as many bars as the improvising fiddler wishes. (A *vamp* is a simple accompanying chord progression that can continue indefinitely, over which a soloist improvises. In "Orange Blossom Special," the vamp consists of nothing but the E major chord, played fast for many bars.)

When the fiddler finishes improvising, the progression goes from E to E7, then quickly moves to A, establishing a new tonality. With the chord A now the tonic chord, the tune goes into its characteristic breakneck-speed melody. The progression goes like this (where A = I):

I – IV – V7 – I
I – IV – V7 – I
I – V7
V7 – I
I – IV
IV – I – V7 – I

Then the tune immediately ducks back to the E chord, where it vamps again for a long time while the fiddle improvises. This is the secret of the power of "Orange Blossom Special." Going to the E chord seems like a return to the original tonal centre but at the same time, it feels like the dominant chord (the V7 chord) of the key of A. The fact that it stays on that V7 chord for a long time builds up a powerful expectation of chord resolution in the brain of the listener, who must wait and wait in delicious anticipation for that V7 chord to finally resolve to the I chord of the new tonality (A), and the return of the breakneck tune.

In effect, the listener doesn't realize it at the outset, but the tune effectively begins on the *dominant chord*, E major, of the main melody's tonality, the key of A major. Because there's no other referencing harmony at the beginning of the song, the listener accepts the E chord as the tonic. Then comes the first surprise: E moves to A, revealing a different tonality for the main melody of the song. Then another surprise: The chord A moves back to E and vamps for a long time, building up anticipation for the return to A major and the main melody.

Vocal Version

In the vocal version, the song starts in the key of E and establishes tonality unambiguously with a 12-bar blues verse, using the three principal chords, E, A, and B7:

> *Look a-yonder comin', comin' down the railroad track*
> *Hey, look a-yonder comin', comin' down the railroad track*
> *It's the Orange Blossom Special, bringin' my baby back*

It then moves to the key of A major and establishes tonality for the main (instrumental) melody. Then it returns to E for another long vamp and repeats the cycle.

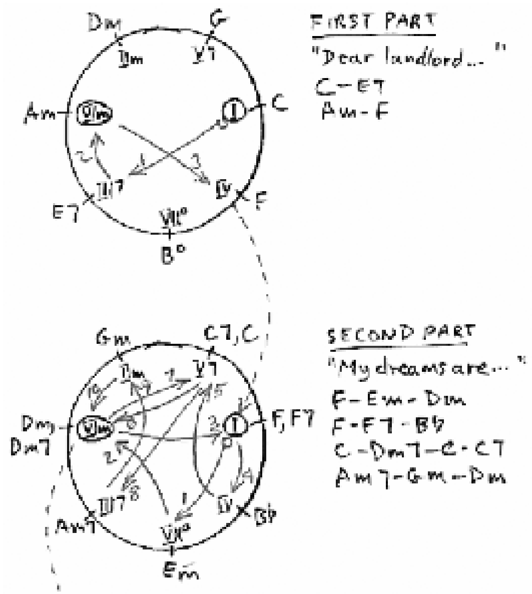
In both versions, it's those long excitement-building vamps on the V7 chord of the key of A that make "Orange Blossom Special" one of the all-time great fiddle tunes.

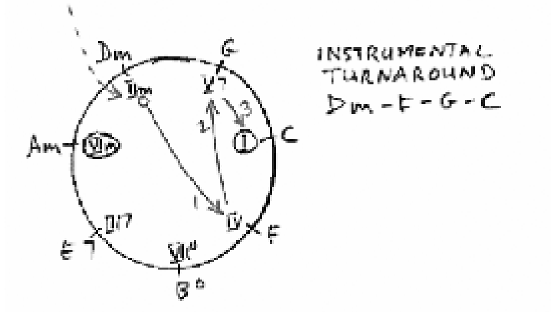
6.13.5 "DEAR LANDLORD": A TOUR THROUGH FOUR KEYS IN 60 SECONDS

"Dear Landlord," one of Dylan's most musically intriguing tunes, begins innocently enough in the key of C Major.

- Within a few bars, the progression modulates to the key of A minor, its relative minor.
- The progression then uses the chord F major to pivot to the key of D minor.
- Then the tonal centre moves on to the key of F major, the relative major of D minor.
- Finally, it moves back to the key of C major via a nifty turnaround: Dm – F – G – C (Figure 108).

FIGURE 108 Chase Chart of "Dear Landlord" (Words and Music by Bob Dylan)





Dylan accomplishes this tour of four keys in just 60 seconds, the time it takes to get through one 20-bar stanza. The cycle then repeats two more times.

If you're unfamiliar with "Dear Landlord," it would be worth your while to listen to this track a few dozen times. Get a sense of how a gifted songwriter at the height of his powers brilliantly uses modulation. It's on the album *John Wesley Harding*, or you can download the song from iTunes and other online vendors.

6.13.6 "ONE FINE DAY": PIVOT-SHIFT-PIVOT

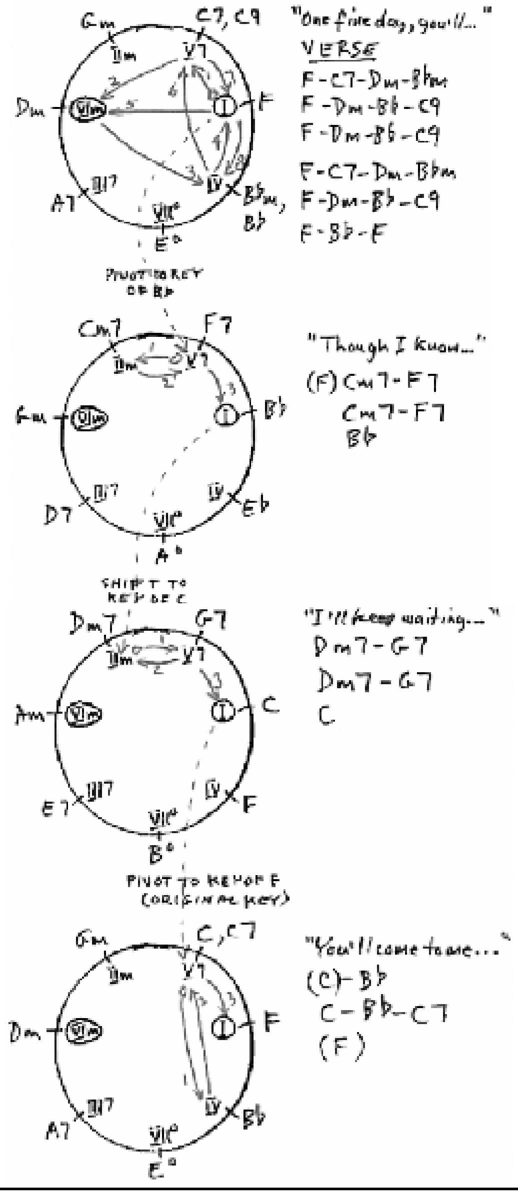
The Chase chart below (Figure 109) shows how "One Fine Day" uses the chord F major to pivot from the key of F major to the key of B♭ major, its harmonic scale neighbour.

The progression then shifts into the key of C major, which happens to be the harmonic neighbour of the original key, F major.

Arguably, you could call this a sequential modulation: the chord sequence Cm7 – F7 – B♭ moves to the sequence Dm7 – G7 – C (all chord roots move up one whole tone).

A *sequence* is a melodic phrase or a chord progression (or both) that repeats at a different pitch. (Sometimes sequences occur with modulation, sometimes without.)

FIGURE 109 Chase Chart of "One Fine Day" (Words and Music by Carole King and Gerry Goffin, 1963)



To get back to the key of F major, the C major chord becomes C7, the dominant seventh of F major—a natural pivot.

Although this song uses the dreaded shift method, it does so in the service of expediting a return to the original key, thereby cleverly absolving itself of sin.

6.13.7 "FREE MAN IN PARIS": TAKING ADVANTAGE OF TRIAD STABILITY

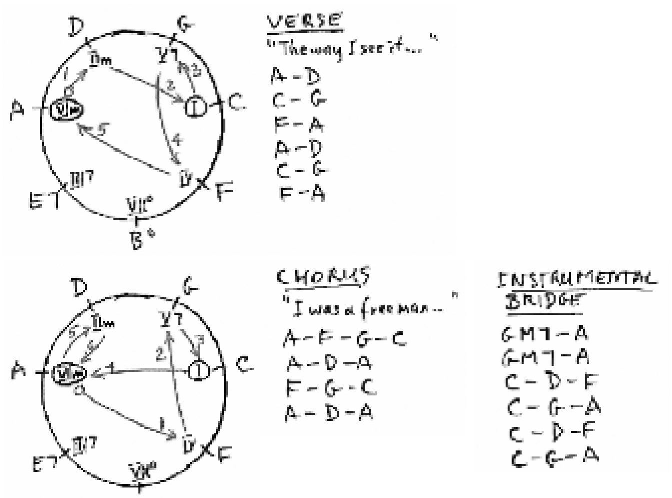
You can get away with a lot if you use a handful of triads. Triads have internal stability. In "I Got Plenty O' Nuttin," Gershwin uses a progression of simple triads to modulate back to the song's original key.

In "Free Man In Paris," Joni Mitchell, empress of open-chord tuning, uses five major triads to shift between the key of A major and the key of C major.

The Chase chart below (Figure 110) shows the variant chords A major and D major in place of the default chords A minor and D minor in the key of A minor—which effectively becomes the parallel key of A major.

All five of the chords for this song can be accommodated in one harmonic scale.

FIGURE 110 Chase Chart of "Free Man In Paris" (Words and Music by Joni Mitchell, 1973)



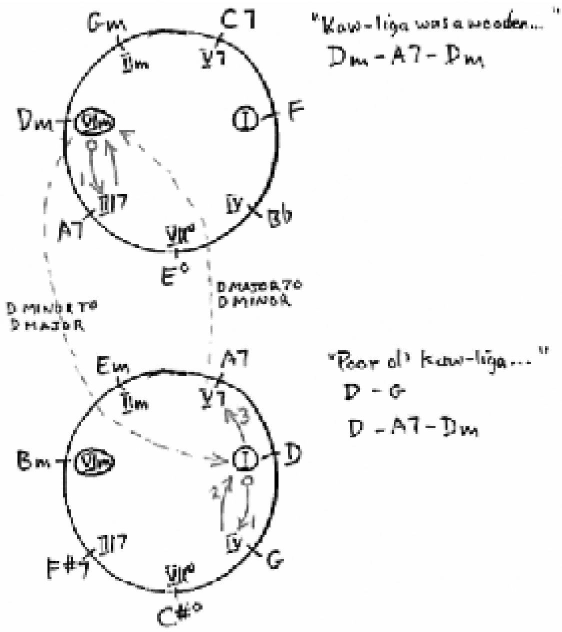
The Chase chart above shows that the last four chords in the verse, C – G – F – A, get reversed in the chorus, A – F – G – C. It's a mirror image, a novel way to create verse-chorus contrast. Did Mitchell plan this, or did it just "happen"? She'll never tell, we'll never know. Alas.

6.13.8
"KAW-LIGA": PARALLEL KEY MODULATION

The Chase chart below (Figure 111) reveals that the chord progression for "Kaw-liga" begins much like the one for "Jambalaya": just two chords, the tonic and the dominant seventh. The only difference is that "Kaw-liga" is in a minor key.

However, in the chorus, the tonic chord switches from minor to major with the same root note. The song modulates from the key of D minor to the key of D major, a parallel key modulation.

FIGURE 111 Chase Chart of "Kaw-liga" (Words and Music by Hank Williams, Sr. and Fred Rose, 1952)



Parallel key modulations can sound remarkably smooth (as in the example of "Kaw-liga") because the tonic chords of two keys share two out of three notes:

D minor = D, F, A
D major = D, F♯, A

Also, both keys share the same dominant seventh chord, the natural chord to use to pivot between the two keys. In the above example, the dominant seventh chord for both keys is A7. This is the chord Hank uses to get back to the key of D minor at the end of the chorus.

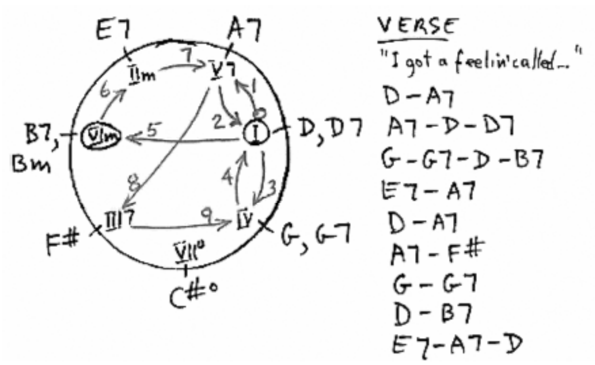
6.13.9 "Lovesick Blues": Relative Key Modulation

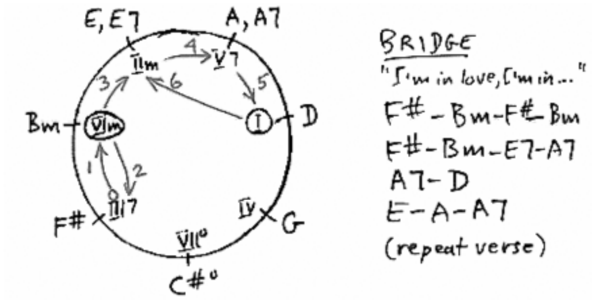
Hank Williams, Sr., did not write "Lovesick Blues," which became one of his greatest hits. It was written a full generation before Hank recorded it.

Remarkably, "Lovesick Blues" has 11 chords—probably the most chords Hank ever played in one song. But none are fancy. They're just major triads, minor triads, and dominant sevenths (Figure 112).

"Lovesick Blues" has several instances of well-placed secondary dominants (B7 – E7 – A7).

FIGURE 112 Chase Chart of "Lovesick Blues" (Words and Music by Irving Mills and Cliff Friend, 1922)





In the bridge, "Lovesick Blues" modulates to the relative minor key, the key of B minor. This provides a welcome contrast, as the verse has no minor chords.

6.13.10 "GIMME SHELTER": SIMULTANEOUS PARALLEL KEYS, FORCEFUL SECOND PROGRESSIONS—AND ONLY THREE CHORDS

"Gimme Shelter," one of the musical wonders of the rock genre, has but one chord in the verse (Figure 113 below). It's a major chord, C♯ major, although the melody clearly uses the parallel *minor* scale, C♯ minor.

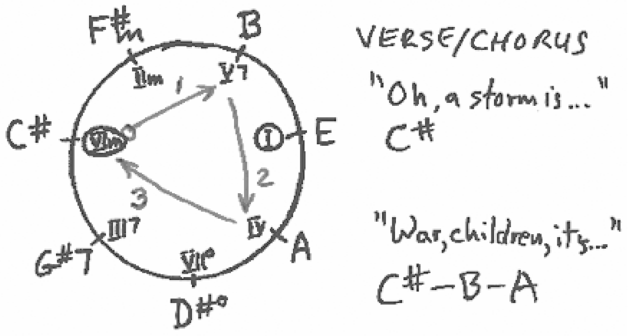
Over and over, the melody emphasizes the *minor* third note (E), characteristic of the key of C♯ minor, while the harmony plays the *major* third *chord* of the parallel key, C♯ major—as though the key is C♯ major. This sets up an incredibly powerful major-harmony, minor-melody clash that seizes the attention of the listener.

You can hear this same sound—a melody that emphasizes the minor third against a major triad—in a lot of blues (not surprising, as the Stones always were a blues-rock band) and old-time country music. It's also the same dissonant harmony you get when you play a major tonic triad and use the Dorian scale for melody. Scale degree 3 is in a minor third relationship with the tonic note in the Dorian mode.

In the Chase chart below, melody trumps harmony (see Chapter 9). That is, the tonic chord is on the *left* side—the minor key side—because melodically, the song is clearly minor. Yet the tonic chord shown is the variant C♯ *major* instead of C♯ minor because that's the chord they're actually playing. In fact, this is a minor-key song that has no minor chords at all!

As the song moves into the chorus, the chords descend slowly by second progressions. At the end of each four-bar phrase, the slowly descending seconds repeat.

FIGURE 113 Chase Chart of "Gimme Shelter" (Words and Music by Mick Jagger and Keith Richards, 1969)



The only third progression appears at the end of each phrase to begin the next slowly descending second progression.

Like "All Along the Watchtower," with which it shares a certain chord-progression similarity, "Gimme Shelter" has no fifth progressions, up or down. No conventional cadences, either.

Both "All Along the Watchtower" and "Gimme Shelter" demonstrate the raw harmonic forcefulness that a songwriter can generate using *second progressions* and only three well-chosen chords.

6.14
Examples: Chase Charts of Great Songs with Modulation and Chromatic Chords

6.14.1
GROUP 4: LIST OF GREAT SONGS WITH MODULATION AND CHROMATIC CHORDS

Modulation and chromatic chords in the same song make for some elegant, attention-getting progressions. Here are some *Gold Standard* songs that have both:

- "Sittin' On The Dock Of The Bay"
- "It Was A Very Good Year"
- "Girl From Ipanema"
- "Georgia On My Mind"

6.14.2
"SITTIN' ON THE DOCK OF THE BAY": MODULATION AND THE POWER OF SIMPLE TRIADS

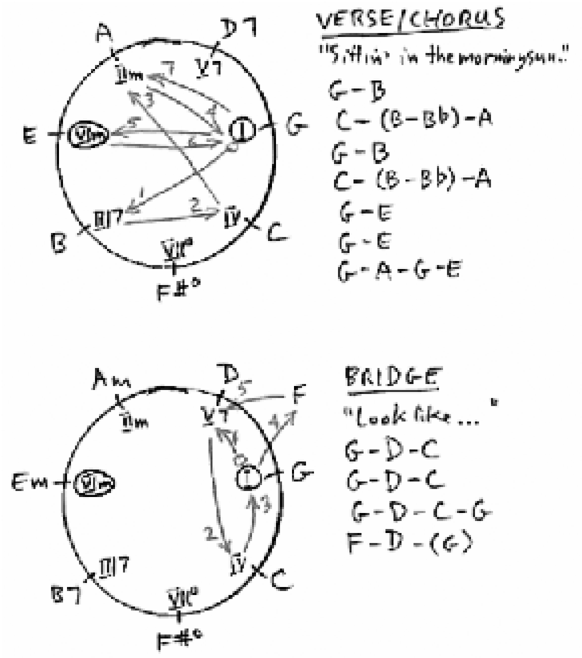
The chord progression of "Sittin' On The Dock Of The Bay" has much in common with the progression of "Free Man In Paris." Both songs use only simple, internally stable major triads. No minor chords, and no seventh chords. And both use chords that effectively convert the relative minor key into its parallel major.

As the Chase chart below reveals (Figure 114), the verse of "Sittin' on the Dock of the Bay" has no fifth progressions, not even fifths to or from the tonic. Consequently, no conventional V – I or IV – I cadences.

The song modulates weirdly between the key of G major and the key of E major—which also has no conventional V – I or IV – I cadences.

Yet the modulation works because only major triads are used, and also because the progression returns to the tonic chord, G major, with sufficient regularity to establish the key of G major as the primary key.

FIGURE 114 Chase Chart of "Sittin' On The Dock Of The Bay" (Words and Music by Otis Redding and Steve Cropper, 1968)



In the bridge, the pattern changes to a standard, single-key I – V – IV progression. This reinforces G major as the song's main key.

Near the end of the bridge, the progression reaches outside the harmonic scale and grabs the chromatic chord F major for one bar.

6.14.3 "IT WAS A VERY GOOD YEAR": SEQUENTIAL AND PARALLEL KEY MODULATIONS

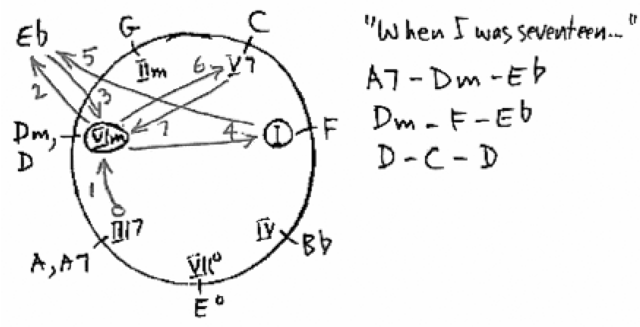
A dominant-seventh-to-tonic progression (A7 – Dm) at the outset of "It Was A Very Good Year" establishes tonality in a minor key.

Then the progression moves outside the harmonic scale to the chromatic chord E♭ for a couple of bars, then back to the tonic.

Sequential modulation follows with a series of second progressions that ends on the parallel major chord (Figure 115 below):

F – E♭ – D – C – D

FIGURE 115 Chase Chart of "It Was a Very Good Year" (Words and Music by Ervin Drake, 1961)



Getting back to the original key of D minor (from D major) then becomes a simple matter of moving to the dominant chord, A7, which is the dominant chord for both keys, and then to D minor.

6.14.4 "THE GIRL FROM IPANEMA": TRANSIENT SEQUENTIAL MODULATION

"The Girl From Ipanema" progresses through quite a few chords—13 altogether.

The sequential modulation used in this song could more accurately be termed transient modulation, because keys other than the original key do not get firmly established. Much like "It Was A Very Good Year."

The chords progress in accordance with a melodic sequence that keeps rising in pitch ...

Oh, but I watch her so sadly
How can I tell her I love her
Yes, I would give my heart gladly

... followed by a different sequence that steps the melodic line back down—and back to the original key.

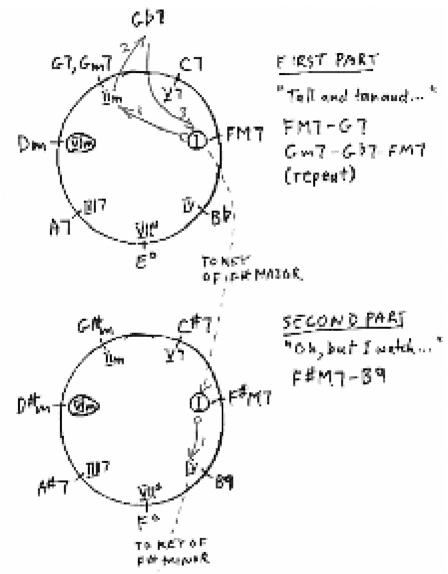
> *But each day when she walks to the sea*
> *She looks straight ahead, not at me*

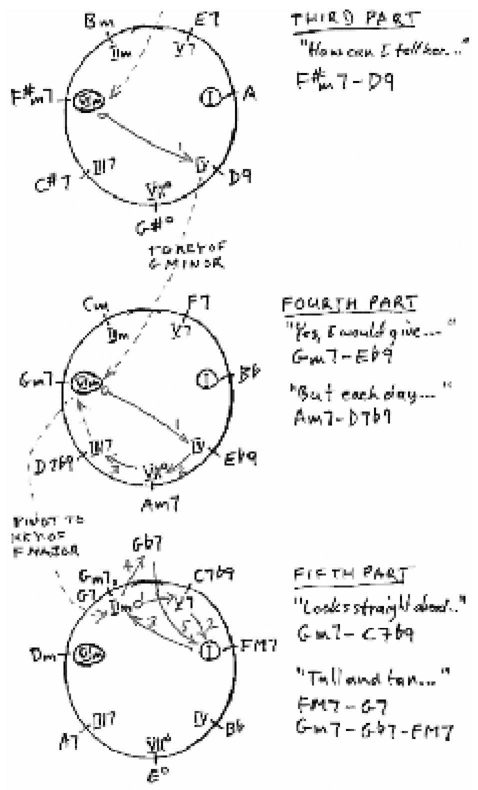
The Chase chart below (Figure 116) shows how pairs of chords change sequentially with the melodic line. Here is the sequence of key transitions (it's actually pretty logical):

- F major (original)
- F♯ major
- F♯ minor
- G minor
- F major

The Chase chart uses five harmonic scale diagrams to map everything out. Get the recording with Astrud Gilberto in the starring role and follow the progression. You'll learn a lot from the famous Brazilian beauty.

FIGURE 116 Chase Chart of "The Girl From Ipanema" (Portuguese Words by Vinicius De Moreas, English Words by Norman Gimbel, Music by Antonio Carlos Jobim, 1963)





Not counting the chords used in the transient modulation sequences, the song only uses one chromatic chord, G♭7, and only for one bar per verse.

6.14.5 "GEORGIA ON MY MIND": MORE RELATIVE KEY MODULATION

"Georgia On My Mind" has 15 chords. Yet it only uses one harmonic scale.

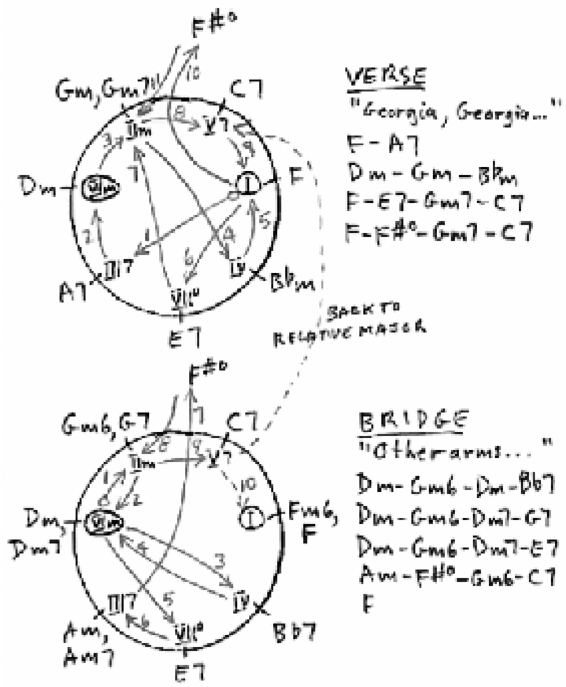
The song has as many as four chord variants at several degrees of the harmonic scale. At IIm, for example, there's Gm, Gm7, Gm6, and G7. At III7, there's A7, Am, and Am7. (See also Cole Porter's "I've Got You Under My Skin.")

As the Chase chart below reveals (Figure 117), the chord progression also makes use of all seven degrees of the harmonic scale.

In the bridge, the song modulates to the relative minor key, D minor.

The only chromatic chord is a diminished chord that makes an appearance briefly towards the end of the verse, and again towards the end of the bridge.

FIGURE 117 Chase Chart of "Georgia On My Mind" (Words by Stuart Gorrell, Music by Hoagy Carmichael, 1930)



A savvy mixture of fifth, third, and second progressions makes the harmony varied and interesting, without imperiling tonality.

In 1960, Ray Charles made the definitive recording of "Georgia on My Mind," 30 years after it was written. The Righteous Brothers and Willie Nelson, among others, also recorded excellent renditions of this great classic.

6.15 When Chord Progressions Go Bad ...

6.15.1 How to Use Chase Charts to Visually Spot Weak Chord Progressions

Now, for your entertainment and pleasure, here are a few examples of the kinds of chord progressions inexperienced songwriters string together, mainly because they don't know about the harmonic scale.

Having studied the above examples by songwriting masters, you will probably figure out pretty quickly why these progressions go off the rails (Figures 118 - 121). Using Chase Charts, you can spot the weakness by looking at the patterns of arrows that correspond to consecutive fifths up, multiple third progressions, sequences of chromatic progressions, non-involvement of dominant and tonic chords, and so on.

This is not to say that such progressions could never work under any circumstances. A songwriter might figure out a way to make them sound palatable in the context of a cleverly-worked-out tune. But why bother with a lot of pointless effort, trying to fix a lame progression? They shoot lame chord progressions, don't they?

Technically, there's no such thing as a "wrong" chord progression in the sense of "prohibited." But there certainly are chord progressions that are easier for the brain to make sense of. That's what this chapter has been all about.

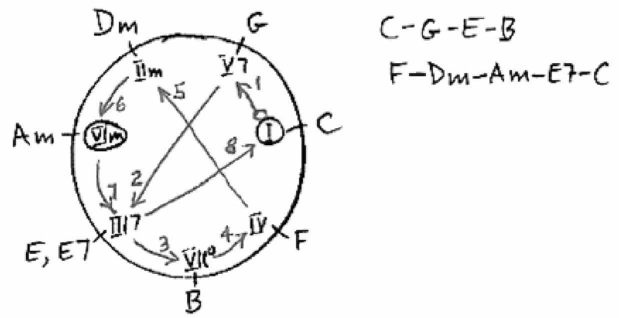
6.15.2 Examples of Chord Progressions that Don't Quite Make It

What's problematic about this one (Figure 118)?

- Two consecutive fifth-up progressions (E – B – F) without involving either tonic chord
- Lots of weak third progressions

- No V7 – I progression to establish tonality

FIGURE 118 Chase Chart of a Weak Chord Progression: Example 1

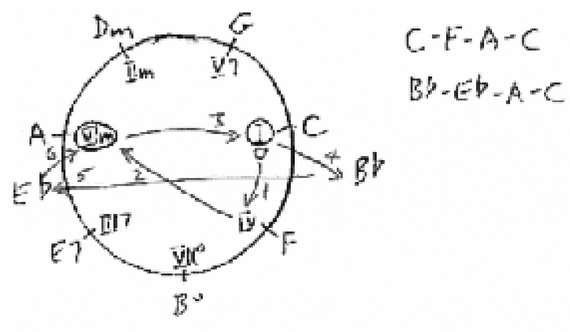


And this one (Figure 119)?

- Two consecutive chromatic chords without establishing tonality ... Key? what key?

- No dominant chord involvement on either the major or the minor side to establish tonality

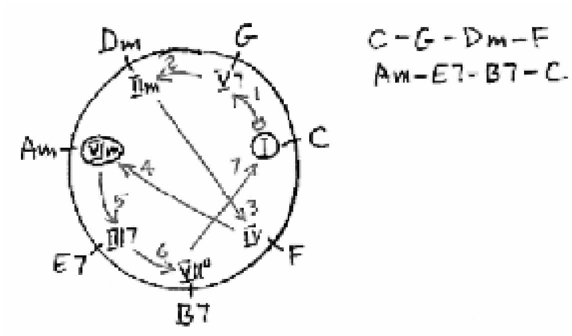
FIGURE 119 Chase Chart of a Weak Chord Progression: Example 2



How does this one get lost (Figure 120)?

- An eight-chord progression that uses all seven harmonic degrees ... pretty ambitious ... too ambitious
- Lots of fifths-up progressions, including tonic-to-dominant progressions on both major and minor sides—but no dominant-to-tonic
- Tonality must be out there somewhere, but not in this progression

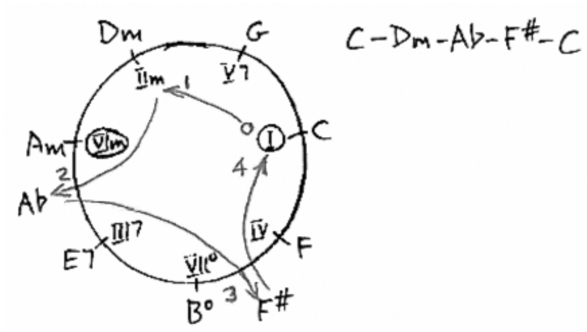
FIGURE 120 Chase Chart of a Weak Chord Progression: Example 3



One final example from chord progression hell (Figure 121):

- Early chromatic chords set the progression adrift in a puddle of harmonic mush, horsefeathers, and month-old gravy
- No fifths-up this time, but no fifths-down, either
- No dominant chords, no tonality

FIGURE 121 Chase Chart of a Weak Chord Progression: Example 4



6.16
What About Chord Progressions Based on the Church Modes?

6.16.1
MODAL HARMONIC SCALES

In Chapter 5, in the discussion of Church modes, it was noted that the Dorian, Phrygian, Lydian, Mixolydian, and Locrian modes have certain properties that cause problems when it comes to creating chord progressions.

Now that you've slogged your way through this long, excruciating chapter on harmonic scales and you know all about Chase charts and how they work, you might be wondering whether or not you could construct viable harmonic scales using the Church modes.

Time to find out.

First, a brief summary of the rules governing the construction of a harmonic scale:

1. A "default" harmonic scale consists of seven chords, each rooted on one of the seven different notes of the diatonic scale.

2. Each "default" chord is a simple triad. For example, in the key of C major/A minor:

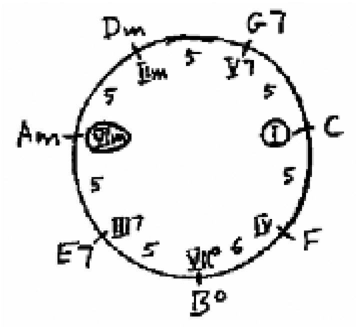
   - There are three major triads, C, F, and G
   - There are three minor triads, Am, Dm, and Em
   - There is one diminished triad, B°

3. The chords are arranged in a circle with chord roots five semitones apart (fifth progressions down, going clockwise). The only exception is the six-semitone interval between the triad rooted on the note F and the triad rooted on the note B.

4. The dominant chords with respect to the tonic major and tonic relative minor chords both get converted to V7 chords to provide the dynamic directionality required to establish tonal centres.

Figure 122 below shows the default circular harmonic scale for the key of C / Am (the Ionian and Aeolian modes, respectively). Inside the circle are the Nashville Numbers and also the number of semitones between chord roots. For example, the number of semitones between the C major chord root and the F major chord root is five.

FIGURE 122 Chase Chart of Harmonic Scale with Numbers of Semitones Between Chord Roots



The three chords of the major mode and the three chords of the minor mode each form a grouping of three consecutive chords. The major and minor modes sound entirely different, which makes for striking natural harmonic contrast within a cohesive harmonic framework. The oddball six-semitone interval, and the rootless, dissonant diminished chord, are located, conveniently, *between* the chord groupings of the two modes.

Proceeding clockwise, the overall effect is palatable and satisfying.

Do the Church modes fare as well?

6.16.2 DORIAN MODE HARMONIC SCALES

To hear what a Dorian mode scale sounds like, play the white keys on the piano beginning and ending with D:

D – E – F – G – A – B – C – D

(Remember, you can play a Dorian mode scale beginning with any note—it doesn't have to be D—so long as you preserve the *order of tones and semitones* for the mode. This applies to all the modes.)

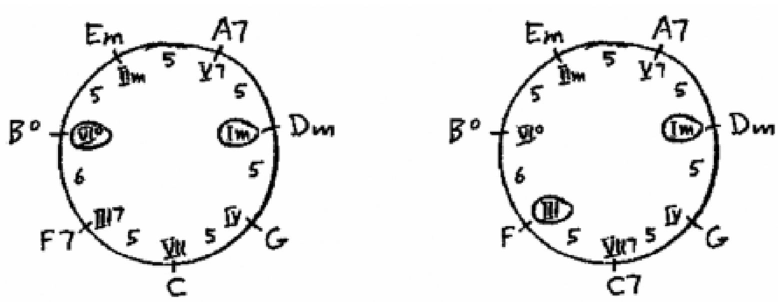
The Dorian mode is considered to be a minor mode because the third note of the scale forms a minor third interval with the tonic note (in the above example, D – F). So the "tonic chord" of the Dorian mode is a minor chord, Dm, in this example (the notes D, F and A).

As shown in the example below (Figure 123), there are two possible relative keys: one with the note B as the tonic, the other with the note F as the tonic. No others are possible because their chords would overlap with one or more of the chords of the modal key.

When you apply the above-listed harmonic scale rules to the Dorian mode, you get two possible versions. One version has the VI chord (B in the example below) as the tonic of the relative key, the other has the III chord (F in the example) as the relative tonic.

FIGURE 123 Chase Charts of Dorian Mode Harmonic Scales

B as Relative Key **F as Relative Key**



Here are the main problems with Dorian harmonic scales:

- The tonic chord of the Dorian scale is minor (Dm in the example), which clashes with the subdominant (G, a major chord).
- The dominant chord, A7, has a non-modal note, C♯, which removes the "Dorian" sound of the mode. But if you replace C♯ with C or D, you lose the tritone. You also lose the leading tone and the power to establish tonality.
- The tonic chord of the "B" relative key is the rootless diminished chord (B°).

- The subdominant of the “F” relative key is the rootless diminished chord.
- In both of the possible relative keys, there is a six-semitone span between the roots of two of the chords.

6.16.3 PHRYGIAN MODE HARMONIC SCALES

The Phrygian scale corresponds to the white keys beginning and ending with E:

E – F – G – A – B – C – D – E

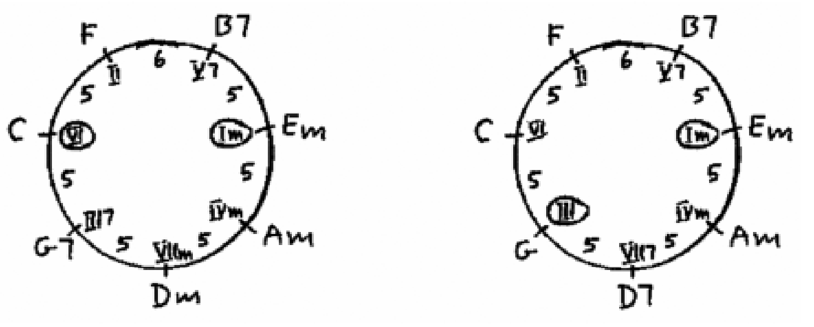
Like the Dorian mode, the Phrygian is considered a minor mode. The third note of the scale forms a minor third with the tonic (in this example E – G), making the tonic chord a minor triad (Em).

And, like the Dorian, there are two possible relative keys, one with VI as the tonic, the other with III as the tonic.

When you apply the harmonic scale construction rules to the Phrygian mode, you get the two possible versions shown in the example below (Figure 124).

FIGURE 124 Chase Charts of Phrygian Mode Harmonic Scales

C as Relative Key **G as Relative Key**



This time, things look somewhat more promising than the Dorian harmonic scales.

- The three principal chords in the above example, Em, Am, and B7, are identical to the chords of the key of E minor. So at least it's possible to establish tonality around the I chord.

- If you consider C as the relative key, its three principal chords are identical to the chords of the key of C major.

- If you consider G as the relative key, its three principal chords are identical to the chords of the key of G major.

But the Phrygian mode has an Achilles heel. As with the Dorian mode, it's the dominant seventh chord—B7 in the above example.

Recall that the dominant seventh chord is the only chord in harmony that has these two properties:

- *Directionality:* it "points" to the tonal centre.

- *Unrest:* it "demands" resolution, specifically to the tonic chord.

The dominant seventh is therefore crucial in establishing tonality. That's why it's called the *dominant* chord. It serves as the gateway, the means of gaining access to a defined tonal centre. Without the dominant chord, no tonal centre exists. There's no cadence effect and your brain senses no meaningful harmonic cohesion.

The main problem with the Phrygian mode is that the dominant seventh chord, B7, contains two non-modal notes, D♯ and F♯. So, using B7 as the dominant chord does not establish tonality in the Phrygian mode. It establishes tonality in the *key of E minor*. To create *Phrygian* tonality, you would need to do something about those two non-modal notes in the B7 chord to fix things up.

But you can't:

- In the above example, if you change the D♯ to D or E, you lose the leading tone and the tritone.

- If, instead, you raise the F♯ to G, you get the chord B7♯5 (B seventh, augmented fifth), which removes the tritone and the resolution potential to the third note of the tonic scale. (And, of course, the D♯ note remains a problem.)

- If, instead, you lower the F♯ to F, you get the chord B7♭5, which removes the perfect fifth interval and introduces a second tritone (B – F, in addition to the B7 chord's normal tritone, D♯ – A). The battling tritones negate the directionality of the chord.

- If you try to change both of the non-modal notes, you get similar undesired effects. For example, if you lower both D♯ and F♯, you get the chord Bm7♭5. Mere anarchy is loosed upon the world. (Try it!) Indeed, the blood-dimmed tide is loosed, and W. B. Yeats rises from his grave, looks around, and spots Johann David Heinichen, also arisen from his grave, autographing copies of the Circle of Fifths.

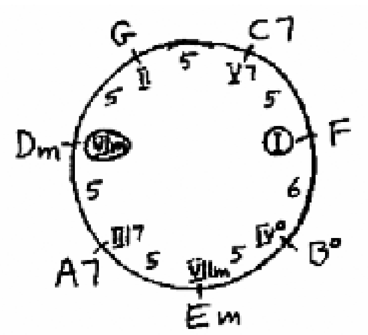
6.16.4 LYDIAN MODE HARMONIC SCALE

Moving on to the Lydian mode, corresponding to the white keys beginning and ending with F:

F – G – A – B – C – D – E – F

The Lydian is considered a major mode. The third note of the scale forms a major third with the tonic, F – A, in the above example, with the tonic chord being F major (Figure 125).

FIGURE 125 Chase Chart of Lydian Mode Harmonic Scale



Of the three principal chords of the Lydian mode, two are markedly unbalanced, one of which is the rootless diminished IV chord.

In the above example, the C7 chord (the V7 chord) contains a non-modal note, B♭, so establishing true Lydian-sounding tonality is a problem.

- If you try to fix it by moving B♭ down to A, you get the chord C6. This removes the unrest of the tritone and a good part of the directionality because, in progressing to the tonic chord, the effect of the semitone resolution from the note B♭ to the note A vanishes.

- If you try to fix it by moving B♭ up to B, you get the chord CM7, which has no tritone. And you lose the resolution of B♭ to the note A, the tonic chord's crucial third-scale-degree note.

As for possible relative keys, if the VI chord (Dm in the above example) serves as the tonic, it clashes with the IV chord, G, which is major. If the III chord, Am, serves as the tonic, the three principal chords are identical to the three principal chords of the key of A minor, which means the dominant seventh chord becomes E7— which contains a non-modal note.

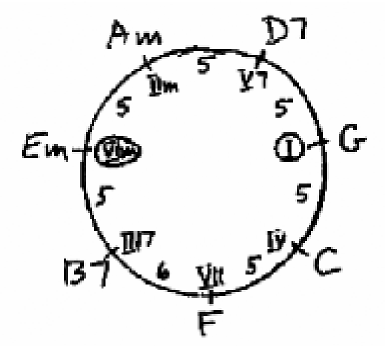
6.16.5 MIXOLYDIAN MODE HARMONIC SCALE

Next up: another major mode, the Mixolydian, corresponding to the white keys on the piano beginning and ending with G:

G – A – B – C – D – E – F – G

The chords of the Mixolydian harmonic scale are identical to the normal (Ionian/Aeolian) harmonic scale except for the transition VII chord at the bottom, which, in this example, is F major instead of F♯° (Figure 126).

FIGURE 126 Chase Chart of Mixolydian Mode Harmonic Scale



Once again, the V7 chord, D7 in the above example, contains a non-modal note, F♯, making the harmony indistinguishable from the key of G major. If you try to fix the problem by lowering the F♯ to F, or raising it to G, you lose both the leading tone and the tritone. Goodbye tonality.

6.16.6 LOCRIAN MODE HARMONIC SCALE

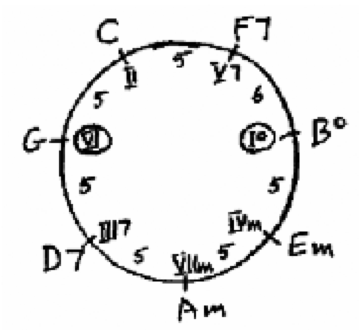
Finally, the Locrian mode, the mode you get when you play the white keys beginning and ending with B:

B – C – D – E – F – G – A – B

Harmonically, the Locrian mode begins in the ditch, clutching a bottle of absinthe, and never manages to crawl out. (Doc Yada-Yadams seems stone cold sober by comparison.)

The *tonic* of the Locrian is the *diminished* chord (Figure 127).

FIGURE 127 Chase Chart of Locrian Mode Harmonic Scale



With the diminished chord as the tonic, the Locrian mode can't even think of establishing tonality.

To summarize, in all five of the Church modes, you can't establish mode-defining tonality using harmonic scale chord progressions due to problems with the V7 – I progression and numerous other unfortunate harmonic incongruities.

Nevertheless, these modes—all of them—can serve as excellent source *scales* for creating beautiful tunes. The secret is to combine modal *tunes* with standard major-minor (Ionian-Aeolian) *chord progressions*. Chapter 9 discusses how to do this.

6.17
Chords and Chord Progressions: Maximizing Emotional Impact

6.17.1
OPTIMIZING UNITY AND VARIETY IN CHORD PROGRESSIONS

The writer Tom Wolfe once advised that, just as a doctor learns, "First, do no harm," so an artist must keep in mind, "First, entertain."

In songwriting, this applies to every aspect: harmony, rhythm, melody, form, lyrics, performance. "To entertain" means pretty much the same thing as, "Create sufficient *variety*. Be interesting. Do not bore the listener."

At the same time, every element has to be accessible. "To be accessible" means pretty much the same thing as, "Create sufficient *unity*. Do not confuse the listener." The human brain seeks patterns.

Figure 128 summarizes this concept:

FIGURE 128 Scales of Unity and Variety

Accessible (Sufficient Unity)

Boring (Lacking Variety)	Accessible but Boring (Irritating)	**Accessible *and* Interesting** (Compelling and Emotionally Powerful)	**Interesting** (Sufficient Variety)
	Confusing and Boring (Complete Turn-off)	Somewhat Interesting but Confusing (Forgettable)	

Confusing (Lacking Unity)

Aim for the upper right.

Your song (or the song you've chosen to play, if you didn't write it) won't grab your audience emotionally if it confuses them musically or lyrically, or if it bores them, musically or lyrically.

A great song, performed competently, gets *everything* right. It strikes a unity-variety balance with respect to *each component*.

- Harmony and chord progressions
- Beat, pulse, meter, tempo, rhythm
- Phrasing and form
- Melody
- Lyrics
- Performance values (live or recorded)

When each of these elements strikes the listener as both accessible (not confusing) and compelling (not boring), the song is irresistible.

At the end of each of Chapters 6 through 10, you will find a table summarizing the key ways of achieving balance—avoiding confusion and boredom—with respect to the chapter's topic.

This being the end of Chapter 6, here's Table 51, summarizing the main ways you can avoid confusing and boring your audience with your chord choices and chord progressions.

(NOTE: As always, these are not hard-and-fast rules. For instance, there's nothing inherently "wrong" with using thirds or fifths up, so long as you know what you're doing.)

TABLE 51 Optimizing Unity and Variety in Chord Choice and Chord Progressions

	Prefer...	Instead of...
Tonality	• Firmly established tonality; use of dominant chord	• Weak tonality; dominant chord absent or de-emphasized
Organizing Framework	• Harmonic scales	• Circle of Fifths • Church mode based harmony
Chord Choice	• Variety: consonant triads, dissonant 7ths, occasional use of highly dissonant or chromatic chords	• All consonant or all dissonant chords
Chord Progression Types	• Seconds, up or down • Fifths down • Fifths up, to or from tonic • Occasional use of chromatic progressions	• Thirds, up or down • Fifths up, away from tonic • Immoderate use of chromatic progressions
Modulation	• Pivot • Relative • Parallel • Sequential	• Shift • No modulation at all

6.17.2 EMOTIONAL EFFECTS OF CHORDS

Table 52 below summarizes some emotional effects associated with various chord types. Emotional effects vary for a given chord, depending on musical context.

TABLE 52 Emotional Effects of Chords

Chord Type	Associated Emotions
Major (e.g., C)	Happiness, cheerfulness, confidence, brightness, satisfaction
Minor (e.g., Cm)	Sadness, darkness, sullenness, apprehension, melancholy, depression, mystery
Seventh (e.g., C7)	Funkiness, soulfulness, moderate edginess
Major Seventh (e.g., CM7)	Romance, softness, jazziness, serenity, tranquillity, exhilaration
Minor Seventh (e.g., Cm7)	Mellowness, moodiness, jazziness
Ninth (e.g., C9)	Openness, optimism
Diminished (e.g., C°)	Fear, shock, spookiness, suspense
Suspended Fourth (e.g., Csus4)	Delightful tension
Seventh, Minor Ninth (e.g., C7♭9)	Creepiness, ominousness, fear, darkness
Added Ninth (e. g., Cadd9)	Steeliness, austerity

6.18
10 Chord Progression Guidelines

Use these 10 guidelines or rules of thumb as you craft your chord progressions. If you do, it's highly unlikely you'll ever create an unpalatable progression.

Here's the first guideline.

6.18.1
10 CHORD PROGRESSION GUIDELINES (# 1): START WITH THE CIRCULAR HARMONIC SCALE AS YOUR BASIC CHORD PROGRESSION FRAMEWORK

> **To secure and preserve harmonic unity, always use the harmonic scale as your starting point, a basic chord progression framework.**

In popular music, you only have three or four minutes to make a complete musical statement. Using the harmonic scale as your basic organizing framework makes it easy for you to establish tonality. As already mentioned, that's the purpose of a four- or eight-bar instrumental introduction to a song.

If you don't establish tonality, the ear just hears random chords and tones, and gets confused or bored quickly.

Establishing a harmonic centre early also enables you to create harmonic contrast (see Guideline #4 below).

6.18.2
10 CHORD PROGRESSION GUIDELINES (#2): LEARN HOW TO USE CHASE CHARTS TO SEE HOW A SONG'S CHORD PROGRESSION ACTUALLY WORKS

A Chase chart is a diagram that maps how the chord progression for any song actually works, revealing the nature of its effectiveness—or lack of effectiveness.

Use Chase charts to map the chord progressions of your own songs, or songs you've heard that intrigue you.

As you've seen in this chapter, you don't need to know how to read or write music notation. Chase charts are easy to sketch and will save you a lot of time while providing you with some real insight on how to create palatable-sounding chord progressions for your own tunes.

6.18.3 10 CHORD PROGRESSION GUIDELINES (#3): USE THE *CHORD PROGRESSION CHART* (APPENDIX 1) TO SAVE TIME AND AVOID FRUSTRATION

Roedy Black's Chord Progression Chart, reproduced in Appendix 1, shows the harmonic scales, including Nashville Numbers, for all 12 major and minor keys.

Use the *Chord Progression Chart* to quickly sketch Chase charts and work out chord progressions for your own material.

6.18.4 10 CHORD PROGRESSION GUIDELINES (#4): TAKE ADVANTAGE OF TONIC CHORD STABILITY

Here's another good reason to make sure you do establish tonality right away (see Guideline #1):

Moving to any chord—even to a chromatic chord—from the tonic chord sounds palatable to the ear, once you've established tonality.

The tonic chord is the stable bedrock chord of the key. So if you move to a chromatic chord from the tonic chord, like this

C – B♭ – C (in the key of C major)

it's usually a good idea to return to the tonic chord (or at least to a chord in the harmonic scale) right away to preserve the sense of tonality (assuming you're not modulating).

6.18.5
10 Chord Progression Guidelines (#5): Take Advantage of Dominant Chord Instability

The dominant seventh chord is inherently unstable (all *dominant-seventh* type chords contain the tritone; *minor sevenths* do not) and can therefore serve as a transition chord to another chord. The dominant seventh is probably the most useful and versatile of all chords.

> **Any chord can always progress to any dominant seventh chord without sounding unpalatable.**

But watch out when you go the other way. Moving from a dominant seventh to *its own* major or minor triad does not sound palatable. For example, try to avoid doing this:

G7 – G

or

G7 – Gm

or at least have a good reason for doing it.

6.18.6
10 Chord Progression Guidelines (#6): Make Structured Use of Chords of the Same Type

You can use sequences of the same type of chord any time:

> **Moving from any chord to any other chord of the same type sounds palatable to the ear.**

You should do it in some organized manner, such as progressing in intervals that are the same distance apart.

For example:

C – G – D – A – E (the classic song, "Hey Joe")

sounds palatable, even though it's moving against the "natural" (clockwise) flow of the harmonic scale, because all the chords are of the same type (major triads).

If you reverse the chord sequence, like this:

E – A – D – G – C

the progression sounds more natural because it goes with the flow, the natural direction around the harmonic scale. The chords of most great songs progress in this general direction.

Another way to string together three or more chords of the same type is to progress along a scale of chord roots (up or down). For example, going up:

C9♭5 – D9♭5 – E9♭5 – F9♭5 – G9♭5

or going down:

G9♭5 – F9♭5 – E9♭5 – D9♭5 – C9♭5

Yet another way to do this is to use a sequence of chords—one set of chords followed by a second, different set of the same chord type, repeated in the same pattern. Like this:

Cm7 – Dm7 – Fm7

followed by (in a parallel phrase or sub-phrase):

Bm7 – C♯m7 – Em7

When you string together three or more chords of the same type, the chord type itself doesn't matter. You can even use extended chords such as 9th, 11th, or 13th chords, so long as you preserve the same chord type throughout the progression.

6.18.7
10 CHORD PROGRESSION GUIDELINES (#7): TAKE ADVANTAGE OF MAJOR TRIAD CONSONANCE TO PROGRESS TO CHORDS BUILT ON THE SAME ROOT

Progression from consonant to dissonant works.

> **Moving from a major triad to any other chord built on the same root sounds palatable to the ear.**

For example:

C – C9

or

C – Cm7

A major triad is a consonant chord, so moving from a consonant chord to a dissonant chord (i.e., any chord except a major or minor triad) built on the same root (in the above examples, the root is the note C) does not introduce the potential problems of harmonic confusion that dissonant-to-consonant progressions (built on the same root) create, such as C7– C or C7–Cm.

6.18.8
10 CHORD PROGRESSION GUIDELINES (#8): TRY NOT TO COMMIT THE SIN OF MONOTONY—USE MODULATION, VARIANT CHORDS, CHROMATIC CHORDS

There are several ways to create variety in your chord progressions:

> **Without losing harmonic cohesion, go for some variety in your chord progressions.**

Here are some ways and means, covered in this chapter:

1. Modulation:

Once you've established tonality, you can use at least four tasteful methods of modulating (changing keys):

1. Pivot chord modulation
2. Relative key modulation
3. Parallel key modulation
4. Sequential modulation

Avoid using shift modulation unless you really know what you're doing and have a good reason for doing it

2. Chord Variants:

You can make a chord progression harmonically interesting simply by replacing the default chords at any of the seven harmonic scale degrees. You have upwards of 30 variant chords to choose from for *each of the seven harmonic scale degrees*.

You can use more than one chord variant at each harmonic scale position in the same song.

3. Chromatic Chords:

Using chromatic chords is not difficult, but you have to be careful not to go overboard, or you'll blur tonality. Review the examples earlier in this chapter.

These are only guidelines. You don't *have* to try to modulate or use chord variants or chromatic chords every time you sit down to compose a tune. As you know, many many excellent songs only have two or three chords—a couple of simple triads and maybe a seventh. But they usually have something else going for them, such as a knockout melody or a gripping lyric.

6.18.9
10 CHORD PROGRESSION GUIDELINES (#9): KEEP IN MIND THE EMOTIONS PEOPLE ASSOCIATE WITH CHORDS

Refer to the list of descriptors in Table 52 once in a while.

> **As you create your progressions, keep in mind that most people associate certain harmonies with more or less identifiable emotions.**

6.18.10
10 CHORD PROGRESSION GUIDELINES (#10): USE A *ROEDY BLACK* CHORD CHART TO SAVE TIME, AND TO AVOID INTERRUPTING YOUR CREATIVE FLOW

Two reference charts provide instant access to the fingering diagrams for all the different types of chords in each key. They also show the chords of the harmonic scale for every key, together with their Nashville Numbers.

> **Use *Roedy Black's Complete Guitar Chord Poster* or *Complete Keyboard Chord Poster* to avoid wasting time looking up chords in books, computers, or chord-finder gizmos.**

7

How Beat, Pulse, Meter, Tempo, and Rhythm REALLY Work

Music is the pleasure the human mind experiences from counting without being aware that it is counting.

—GOTTFRIED LEIBNIZ

All right, you cats been talkin' 'bout you got rhythm. You got this and you got that. *I* got rhythm! I'm gonna see what you all got.

—LOUIS ARMSTRONG

7.1 Evolution, the Brain, and Rhythm

7.1.1 Where Rhythm Comes From: The Time-keeper in Your Brain

Your brain's evolved mechanisms for coordinating and synchronizing movement enable you to walk, jog, run, jump, dance, and tie your horse to a hitchin' post—all

tasks that require sophisticated coordination. When disease or injury disrupts your brain's time-keeping system, you experience motor impairment (multiple sclerosis, for example).

Music and language both require elaborate time-keeping. They parallel each other rhythmically. Rhythmic motion is an important element in mother-infant communication, indicating a linkage between rhythm and the other elements of music in the evolutionary origin of music-making.

In modern humans, bodily movement typically accompanies song: head nodding, tapping, clapping, dancing, swaying. It's the rule, not the exception. It's unusual to listen to a musical performance that has a pronounced rhythmic element *without* participating to some degree in the rhythmic flow.

7.1.2 EVOLUTIONARY PERSPECTIVES ON THE AUDITORY SYSTEM, SENSE OF BALANCE (VESTIBULAR SYSTEM), BIPEDALISM, AND LOCOMOTION IN HUMANS

The human brain has a general coordinating mechanism that links everything required for speech and music-making—auditory and visual information, motor channels, timing.

Your vestibular system, which controls balance, connects physically to your inner ear. Rhythmic control of balance and body movements required for bipedal locomotion was in place before the evolution of the rhythmic element of music-making (vocal music and dance).

Walking, jogging, and running require an inborn clock for coordination. If you walk any distance, you usually set a rhythmic pace: each step takes an equal amount of time. Same with jogging and running. You can think of dancing as fancy jogging or running in place, and in sync with other jogger-dancers.

As discussed in Chapter 1, the capacity for rhythmic entrainment is an evolved trait exclusive to humans. A baby enjoys a much richer musical and bonding experience when Mom bounces or rocks baby rhythmically to music, compared to simply having music played for baby in the crib. Enjoyment of the direct experience of music carries over from infancy to childhood, adolescence, and adulthood. People tend to prefer attending live music events that encourage or at least tolerate audience entrainment, compared with events at which audiences are expected to sit quietly and be still while the musicians play.

7.2 Your Brain's Evolved Memory Functions

Everything in life is memory, save for the thin edge of the present.
—MICHAEL S. GAZZANIGA

7.2.1 MUSIC AND MEMORY LIMITATIONS

To comprehend and appreciate music, you have to remember *sequences of events* such as chord changes, melodic phrases, riffs, lyric lines, and so on. Music unfolds in time, bit by bit, unlike other art forms such as painting, which you can grasp as a whole, without having to hold some of it in memory over time. On a time-space continuum of the arts, music is at one extreme, painting at the other:

TIME							**SPACE**
music	poetry	novels, stories	theatre, movies	dance	architec-ture	sculpture	painting

Alas, unlike computer memory, human memory has severe natural limitations. Nowhere is this more evident than in music. Humans can remember only a few recent musical events without reference to previously-heard events. The brain's short-term memory buffer is limited in capacity to only a handful of items and a time span of only a minute or so.

Because of human memory limitations, each element of music needs to be inherently repetitive. Beat. Chord changes. Motives. Riffs. Melodic phrases. Verses. Choruses.

Short-term memory limitations render overly complex music incomprehensible. Songwriters and composers who don't understand this find themselves with vanishingly small audiences.

If you write music that has a lot of novel (i.e., unrepeated) melody, or numerous changes in meter, or no discernable tonality, then prospective listeners will turn away, irritated, unable to find any meaningful patterns that might provide something approximating an enjoyable musical experience.

7.2.2
SHORT-TERM AND WORKING MEMORY

> Every composer knows the anguish and despair occasioned by forgetting ideas which one has not time to write down.
>
> —HECTOR BERLIOZ

When you recall something from memory, you actually *reconstruct* the memory. You don't retrieve it, the way you retrieve a file from a cabinet or from a "folder" on your computer. Each time you reconstruct a memory, it's a bit different. You may think you're *certain* something happened the way you recall it, but that ain't the case. As discussed in Chapter 1, you remember the *gist*, not the exact details, even if you *think* you remember the exact details.

Your brain does not have a single "memory processor," nor a single memory storage area. There are several kinds of memory, and your brain stores memories in many places.

Short term memory is limited in *capacity* to about seven items, plus or minus two. (Using sign language, the number is only about five.) It's limited in *duration* to a minute or less. What you hold in short-term memory is always being over-written. (Why did the Post-It note become phenomenally successful? It enables you to capture on paper a small amount of information currently in your short-term memory, before it gets over-written.)

CHANGE BLINDNESS: GORILLA? WHAT GORILLA?

Thanks to short-term memory limitations, focussing your attention on one thing in your environment causes you to fail to notice other things, even if they're happening literally right under your nose. The psychologist Daniel Simons and his colleagues refer to this phenomenon as "change blindness."

Picture this. A stranger stops you to ask for directions. You and the stranger talk for 10 or 15 seconds. Then two workmen carrying a door walk between you and the stranger. After the workmen pass by, the stranger is a different person. The new stranger is wearing different clothes, is different in height, and has a different sound to his voice. What are the odds that you will notice that the person you are now talking to is actually a different person from the one you were talking to before the workmen carrying the door walked through?

Only about 50-50.

Daniel Simons and his colleagues have conducted numerous other experiments, replicated by other researchers, demonstrating change blindness due to short-term memory limitations. The gorilla experiment, for example. A group of people are watching a video of an informal basketball game. They're instructed to count the number of passes made by one of the teams. Partway through the game, a woman in a gorilla suit strolls into sight among the basketball players. She even stops, faces the camera, and thumps her chest before moving out of the picture. Altogether, the gorilla is clearly visible for nine seconds. Viewers of the video who are not instructed to count passes all report that they noticed the gorilla. But half or more of those instructed to count passes are so focussed on that task that they fail to notice the gorilla.

You can see the gorilla video and other change blindness demos at this website:

http://Viscog.Beckman.uiuc.edu/djs_lab/demos.html

The Phonological Loop

One aspect of short-term memory enables you to overcome these limitations to some degree through repetition. This is called the *phonological loop*. It's only good for about five seconds' worth of information, which you have to keep repeating. For example, you can look up an unfamiliar number in the phone book and keep repeating it to yourself until you actually dial the number. Once you dial the number and the phone conversation starts, your short-term memory becomes occupied with the demands of the conversation, and the phone number fades forever. And you won't be able to recall it because you did not commit it to long-term memory. If you need the number again, you have to look it up. Dang.

With enough repetition, something you hold in short-term memory, such as a phone number, can become encoded in long-term memory.

That applies to songs.

Which is exactly why songs need so much repetition.

With a single exposure to a new song that typically includes several repetitions of a verse and chorus, a listener retains a small bit of the tune and lyrics. The gist of it. Only after many exposures to the entire song will the listener have the whole melody and lyric encoded in his or her brain.

Working Memory

Working memory encompasses short-term memory and other memory-related functions. Working memory is sometimes called *working attention* because it refers not only to what you can hold in short-term memory, but also to how you can use the information, including information you can summon from long-term memory.

Working memory involves the concept of *attention*—your ability to repress irrelevant stimuli and focus on enabling stimuli and information. That includes whatever is important in your immediate environment that is not stored in your long-term memory, plus recollections you bring into your working memory as needed. All the while, though, your short-term memory buffer limits what you can do without looking up information recorded in notes or books or images or other stored data.

SHORT-TERM MEMORY AND GAMBLING MACHINES

> *Horse sense is the thing a horse has which keeps it from betting on people.*
>
> *—W. C. FIELDS*

The psychopaths who program electronic slot machines know exactly how to exploit the limitations of short-term memory. They deliberately set up the machines so that the player experiences a high proportion of near misses, deceiving the player into thinking the odds of winning are much much higher than they actually are. If the machine has a "stop" button, the player is duped into thinking he or she has some control over where the spinning reels halt. In fact, the outcome is electronically determined the moment the player pushes the spin button. The "stop" button is utterly fraudulent, designed only to speed up the rate at which the player loses money.

Gambling machines are programmed to keep the player hooked with near misses and small wins. The player wins small sums frequently enough that he or she forgets the long trend: steady losses. Within the span of short-term memory, it always seems as though the machine is paying off and could cough up a jackpot at any moment. The conned player loses track of time and money, and eventually walks away busted.

The larcenous swindlers who run casinos and other gambling businesses concoct euphemisms such as "gaming entertainment" to put a friendly face on the cheat-machine industry.

7.2.3
"CHUNKING" TO THE RESCUE (MORE OR LESS)

You can remember only about seven items at once. But if you *group* related items into larger units, your short-term memory treats those units as individual items, which frees up your working memory to admit more information—up to a point. Such grouping is called *chunking*. (It's the reason phone numbers and credit card numbers are separated into groups of three and four.)

You could pretty easily remember a series of five random letters of the alphabet by repeating them in a phonological loop. You'd have a much harder time remembering 45 random letters because the phonological loop is limited to only a few seconds. But you could easily memorize 45 letters if they took the form of five random *words*, each consisting of nine letters.

> **In practically every aspect of music, including lyrics, chunking plays an central role.**

As you'll see shortly, your brain automatically chunks (groups) a steady sequence of discrete beats into larger units called pulses. Pulses chunk into still larger units called bars or measures, which chunk into still larger structural units (the subject of the next chapter).

But chunking has its limits. People find it much more difficult to remember a 15-minute symphonic movement or a 50-minute symphony, no matter how well-chunked it is, compared with a three-minute popular song.

7.2.4
LONG-TERM DECLARATIVE (EXPLICIT) MEMORY

Most of the stuff you've got stored in long-term memory is *unconscious.* In chapter 10, you'll learn a procedure you can use to take advantage of your unconscious mind to create unique, emotionally powerful song lyrics (including rap lyrics) that will surprise and amaze you (and your listeners).

Two kinds of long-term memory are broadly recognized:

1. ***Declarative memory*.** Sometimes called *explicit* memory. This is your memory of events, facts, concepts.

2. ***Procedural memory*.** Sometimes referred to as *implicit* or *non-declarative* memory. This is your memory of how to do things—your skills and habits.

Starting with declarative memory ... there are two kinds: episodic and semantic.

Episodic Memory

Episodic memories are memories of one-shot events and experiences that your brain encodes permanently. Thanks to episodic memory, you can recall the story of your life, a series of experiences ("episodes") stretching back to your early childhood and involving many people and places. In large measure, who you are is what you remember.

In your brain, your hippocampi pass on such memories to your cortex, where they become encoded as long-term memories. (You have two hippocampi, one camped in each hemisphere. If you look at images of them at just the right angle, they look like two hippos sitting around a campfire, roasting squirrels and singing "Kum Ba Yah.")

If a surgeon were to remove your hippocampi, you would remain forever stuck in the present, unable to remember new experiences, but with memories of your past intact. This was the fate of a patient named H. M. After an operation that successfully relieved his epileptic seizures but involved removal of his hippocampi, H. M. was unable to form new episodic memories. He could only function within the limits of short-term memory. H. M. remained stuck in the moment, in the year 1953, for the rest of his life.

During an emotionally meaningful event, an emotion-processing part of your brain called the amygdala comes into play and burns both the event and the associated emotion vividly into your long-term memory. Events such as the wedding or death of someone close to you; 9/11; a car crash in which you broke both your arms but survived. When you recall such an event, you experience the associated *emotion* as well.

It's not hard to see why this capacity evolved in humans and other animals. You have a better chance of surviving a future event that threatens your life (or, on the other hand, a future event that improves your odds of passing on your genes) if you recognize from memory a similar event taking shape, and that recollection triggers an *emotional reaction*. Even in ordinary everyday life, when something in your environment, such as a newspaper headline, reminds you of a traumatic situation you once experienced, you will feel the associated emotion. If what you experienced was extremely traumatic, such as war or violent crime, you may suffer emotionally for many years, every time you recall the experience (post-traumatic stress disorder).

Semantic Memory

Semantic memory is your memory of facts, concepts, meaning. Different kinds of information that relate to the same concept or fact are linked in your semantic

memory. For example, your memories of the images of people you know are linked with your memories of their voices and other information about them.

When you see a movie, the visual images become linked in your memory with the musical soundtrack.

You can recall millions of things stored in semantic memory. For instance:

- You know at least one language, which means you know tens of thousands of words and hundreds of thousands of dictionary definitions (many words have several different meanings).

- You know a lot of stuff you've absorbed from reading. It's the *content* that exists as semantic memories, not the specific words and sentences.

- You know a lot of songs and song fragments. You may not know *all* the words and music to thousands of songs, but you could probably recall at least bits and pieces of thousands of songs if prompted with their titles.

Semantic memory is the kind of memory that encodes in your brain facts such as the names and birth dates of your band members and their horses. Unlike episodic memory, it often takes effort and repetition to commit information to long-term semantic memory. A good popular song has a lot of repetition to make it easier for listeners to memorize it—whether they want to or not.

7.2.5
LONG-TERM PROCEDURAL (IMPLICIT) MEMORY

Most of the time, what you commit to procedural memory goes on without your conscious awareness. For instance, you move into a new apartment and gradually "get to know" the place. At first, the stove seems a bit awkward because the controls on the stove at your old place were positioned somewhat differently. And the old stove had smaller burners. Your new kitchen has more lights and you have to learn where the switches are. The toilet runs, so you have to keep flicking the dang handle. Gotta get it fixed.

But after a few weeks, you know where everything is and how every appliance works. You move around your new place without the slightest hesitancy.

Unconsciously and automatically, your brain has stored all the information you need about living comfortably in your new place as *procedural memory.*

You can also deliberately create procedural memories. This is the kind of memory that enables you to play a musical instrument. Practice, practice, practice. If you finger the same chords and play them rhythmically over and over, after a while it

becomes second nature, like riding a horse or driving a car. Stored permanently in procedural memory.

Table 53 below summarizes the various kinds of memory.

TABLE 53 An Oversimplified Sketch of Human Memory

Short-term/Working Memory
• Limited to a minute or two in duration, and to about 7 items; constantly gets overwritten • Phonological loop—a few seconds • Chunking • Attention • Information "brought to mind" (recollected) from long-term memory

Long-term Memory		
Declarative		**Procedural**
Episodic • Events, experiences • Hippocampus • Amygdala—emotions linked to memories of experiences	***Semantic*** • Concepts • Facts such as the songs you know from memory	• "How-to," such as your ability to drive a car, ride a horse, or play a musical instrument

7.2.6 REPETITION AND MEMORY IN MUSIC

Recall that the visual metaphor of rhythm is length. As you walk along a street, you can see visual repetition all around you: the spacing between street lamps, the regular dashed white lines in the middle of a paved road, the equally-spaced floors of an apartment or office building. Humans divide space into regular lengths.

In music-making, your brain divides *time* into regular lengths. Since music takes place in the dimension of time instead of space, memory limitations require that the major musical elements be constantly renewed and reinforced at regular intervals. In other words, *repeated*.

- Harmonically, you have to keep repeating the I chord and the V chord, or your brain forgets where the tonal centre is.
- Melodically, you have to return to scale degree 1 every so often.
- Rhythmically, you have to keep repeating the underlying beat, or your brain forgets there is an underlying beat.

HOW TO GET RID OF AN EARWORM

James Kellaris, a marketing professor at the University of Cincinnati, is credited with popularizing the term "earworm" (from the German *ohrwurm*) to describe a tune that gets stuck in your head. An earworm is an irritating melodic pattern in your brain that won't go away. A mental itch. The only way you can scratch it is by playing the earworm in your mind. If you're lucky, you will eventually find relief within a few hours.

Simple tunes are the best candidates for earworms, such as "The Lion Sleeps Tonight" (aka "Wimoweh" or "Mbube"), "We Will Rock You," and "It's A Small World After All."

Here are several known ways to remove an earworm:

- Distract yourself by doing something that requires the use of speech and/or music modules, such as singing some other song or reciting the *Gettysburg Address*.
- Sing the earworm all the way through to the end, then say, "Thang-ya. Thang-ya verra much." Then say, in an authoritative, yet avuncular voice, "Elvis has left the building."
- Shoot yourself in the head. Note, however, that Doc Yada-Yadams, a fully qualified neurosurgeon, advises that this method may not get rid of a particularly nasty, persistent earworm, and could damage some of the delicate structures that comprise other modules in your brain.

  Marshal McDillon advises that this procedure is illegal. You could get arrested. Ms Puma advises that the Marshal's logic is faulty. Deputy Fester advises he'll carry out Marshal McDillon's orders. Ellie Sue advises she'll marry Deputy Fester if he writes her a nice song. Jack White of the White Stripes advises he's going to Wichita. Sadie, President of the Dodge

City Chamber of Commerce, advises, "So what does that make Doge City, Jack? Chopped liver?"

7.3 Beat vs Pulse

7.3.1 How Unmeasured Music Differs from Measured Music

Not all music is rhythmic. You sometimes hear music that has *no beat*. For instance, quite a bit of background television and movie music consists of nothing more than irregular successions of chords or melodic flourishes. You hear similar sounds in sub-genres of New Age and environmental music. And medieval plainchant. And some Chinese and Japanese music.

Free-flowing unaccompanied music with no regular beat is called *unmeasured music* or *measureless music.*

When other voices or instruments begin to accompany free-flowing chords or melodies, the brain senses a desire to have the sounds synchronized. Otherwise, chaos may reign.

Sometimes chaos *does* reign. For instance, when—deliberately or accidentally—several instruments play simultaneously without any intention of synching up. Or when the players of a symphony orchestra tune their instruments to the oboe player's A-440 just before a performance.

Music that has a steady beat throughout, even during brief silent passages (fermatas or pauses), is called *measured* music. The uniquely human ability to entrain to a steady beat gives rise to the organizing principle that makes possible everything rhythmic in music, just as human attunement to simple ratios of frequencies makes scales and chords possible.

Measured music is the default, the musical universal; unmeasured music is the exception.

Interestingly, there seems to be no half-way point between measured and unmeasured music. Music either has a steady beat you can entrain to, or it has no discernable beat. Hardly any music is partly measured and partly unmeasured.
Hundreds of thousands or perhaps millions of years ago, hominids undoubtedly used

rocks as the first musical instruments (other than singing, hand clapping, foot-stomping). Imagine: rocks as percussion instruments. Beat-keeping devices.

Today, practically all the music most people hear is measured music, music with a steady underlying beat. That's "home," rhythmically speaking. It's the ceaseless, steady, unchanging beat that makes rhythmic adventure possible, just as tonality makes melodic and harmonic adventure possible.

7.3.2 HOW YOUR BRAIN "PREDICTS" THE BEAT IN MEASURED MUSIC

Brains are prediction machines.
—GEOFFREY MILLER

Rhythmic motion originates in the brain, not in dancing leg muscles. Just as singing a song originates in the brain, not in the movement of vocal folds in the larynx. In measured music, stimulus does not lead to response; stimulus *coincides* with response. Perception and action couple together.

The human brain has evolved the capacity to *predict* when the next beat will occur. If this were not the case, you would not have the ability to tap your foot in time to, say, the steady click of a metronome. Your foot-tapping would fall behind or speed ahead erratically. You have the capacity to *synchronize* your behaviour to a steady beat, and so do your fellow humans—your audience.

Since stimulus and response coincide in a regular beat, the beat functions, in effect, as the stimulus for synchronizing behaviour. Groups of humans have the ability, then, to lock into an isometric train of beats, coordinating behaviour en masse.

It has been hypothesized that hearing a steady beat induces neural "clocks" in your brain that enable you to synchronize your physical movements to the sequence of beats. So you can sing, dance, or play a musical instrument in sync with an external regular beat. You have the natural ability to move *in response to music* (e.g., dance), and also to move whatever body parts you need to move *to create music* (sing or play an instrument).

Because you have a sophisticated beat-prediction ability, a simple steady beat can bore you pretty quickly. So great songwriters and performers tend to deliberately foil your beat prediction mechanism, as you'll see later in discussions of irregular meter, syncopation, and improvisation.

7.3.3
HOW BEAT DIFFERS FROM PULSE

This chapter focuses on measured music, music with a beat. If you want to understand how to manipulate beat in your songwriting and performing to create emotionally powerful music, you need a good grasp of the nature of these fundamental elements and how they work:

- Beat
- Pulse
- Meter
- Tempo
- Rhythm

They're all different, but interrelated.

Beat

First: distinguishing beat from pulse.

For purposes of this discussion, beat refers to the basic, undifferentiated metronomic temporal setting of a piece of music.

Here are some ways to conceptualize "beat":

- If you've done some recording, you're probably familiar with click tracks. Think of beat as the click track of a song, the simple, steady ticking of the metronome. Suppose you play a recording of a song through a sound system. As the recording plays, suppose you set a digital metronome so that it ticks in sync with the recorded song. That metronome's ticking is the beat.

- **Beat has no emphasis, no accent.** It's just *tick tick tick tick tick tick tick tick.* It's not *TICK tick TICK tick TICK tick TICK tick TICK tick*.

- Beat continues on in your brain even when the music temporarily ceases.

- Beat is the rhythmic unit that gets you tapping your foot or clapping your hands or nodding your head or pumping your fist.

- As you'll see later, beat is not necessarily the smallest unit of time in a piece of music. But it's the *basic* unit.

Pulse

Some authorities make no distinction between beat and pulse. For purposes of this discussion, think of pulse as different from beat, but *related*. Here's how.

When you switch on an ordinary metronome, at first you hear this:

tick tick tick tick tick tick tick tick ...

But within a moment or two, your brain perceives *groups* of two ticks, like this:

TICK tick TICK tick TICK tick TICK tick ...

Or, depending on your mood, groups of three ticks, like this:

TICK tick tick TICK tick tick TICK tick tick ...

Or groups of four ticks, like this:

TICK tick TICK tick **TICK** tick TICK tick...

That's your brain *automatically chunking beats into pulses*. Even though you know that the ticks of the metronome do not vary in loudness, your brain will have none of it. Instead, your brain assigns every second or third beat a seemingly louder "tick," a *stress* or *accent*, thus chunking (grouping) a sequence of undifferentiated ticks into larger, more comprehensible units.

Pulse is the first of several levels of beat chunking.

The same thing happens in speech. Every time you open your mouth and utter a phrase or sentence, you automatically stress some syllables more than others. You emphasize every second or third syllable. When you say "metal," you don't say "met-al" in a monotone. Instead, you say:

met-
al

"Met" is not louder than "al"; rather, "met" is *higher in pitch*. It doesn't matter whether you speak English or Hindi or Inuktitut. Your brain's language modules have evolved to distinguish words and phrases from each other in part through differential pitch-accenting of syllables.

With words, it's pitch that varies from syllable to syllable. With pulse, it's loudness (and, with one type of pulse, duration also) that varies from beat to beat.

Pulse always has at least one accented beat and one unaccented beat.

There are three (and only three) varieties of pulse:

- ***Duple pulse:*** two beats of equal duration, the first of which is accented;
- ***Triple pulse:*** three beats of equal duration, the first of which is accented;
- ***Skipple pulse:*** two beats of *unequal* duration, the first of which is accented.

Musicians who play rhythm parts tend to play pulses, not beats. For instance, in rock, when you hear the drummer's familiar "kick-snare-kick-snare," you attend more to pairs of beats (pulses), not individual beats.

When you listen to music (especially live music), sometimes you tap or clap or nod or pump on every *unaccented* beat of a pulse (the off beat or back beat). Sometimes you tap on every *accented* beat of a pulse. But not often on both accented and unaccented beats (a good workout!).

If you're at a bluegrass festival and you tap your foot on the *unaccented* beat during a fast rendition of "Fox On The Run," unkind strangers might point at you and laugh.

If you're at a gospel revival and you clap on the *accented* beat during "Oh Happy Day," unkind strangers might point at you and laugh.

Before elaborating on each pulse type, a word on habituation.

7.3.4
HOW HABITUATION WORKS

Your brain attunes and responds to *change*. If a stimulus in the environment does not change, your brain starts to ignore it. This phenomenon is called *habituation*. It applies to all sorts of stimuli. For example, you wake up and smell the coffee. But within a little while, you don't smell the coffee any more, even though the aroma is still in the air, because you've become habituated. Nothing has changed, so your brain ignores it.

If you hear a sound repeated over and over, habituation kicks in. Your neurons get fatigued. Response diminishes. After a while, your brain ignores the repeated sound unless something unexpected happens. This applies to every element of songwriting, and to whole songs. A successful song introduces novelty at some level at frequent intervals as it unfolds in time. But not too much novelty, or listeners get confused and lose interest. Novelty (variety) is vital, but repetition (unity) is equally vital.

To avoid rhythmic habituation, you use various rhythmic phrases that contrast with the steady beat. That way, you get unity and variety happening simultaneously. The first level of beat-contrast is pulse.

7.4
Types of Pulse

7.4.1
DUPLE/QUADRUPLE PULSE

Of the three varieties of pulse, duple pulse is by far the most common—one accented beat, followed by one unaccented beat: ONE two.

Accents	●	•
Counted Beats	1	2

Duple pulse almost invariably chunks (groups) into *pairs* of duples: four beats, with the first and third having an accent: **ONE** two THREE four **ONE** two THREE four. Beat one has a heavier accent than beat three. Like this:

Accents	●	•	●	•	●	•	●	•
Counted Beats	1	2	3	4	1	2	3	4

This is the default pulse—*quadruple pulse*—the pulse your brain finds easiest and most natural, *the pulse of the great majority of popular songs.* Classical music, too.

7.4.2
TRIPLE PULSE

Triple pulse is not as common—one accented beat, followed by two unaccented beats: ONE two three. Like this:

Accents	●	•	•
Counted Beats	1	2	3

While not found in many popular songs, triple pulse plays an important role in several kinds of *meter*, the level of chunking immediately above pulse. You'll see how shortly.

7.4.3 SKIPPLE PULSE

The first two pulse types—duple and triple—you know well. But *skipple*?

Skipple is also known variously as "swing" or "shuffle" or "triplet groove." But such descriptors don't cut it.

In North America and Europe, "swing" narrowly connotes swing music of the 1930s and 1940s—"Big Band" music. But the fact is, skipple pulse can be found in every major genre of popular music, past and present: blues, jazz, hip-hop, rock, folk, country, you name it. It's also common in traditional native American music.

Skipple pulse is found in all sorts of non-Western music as well, such as:

- Bhangra, a style of centuries-old Punjabi folk music that has lately become a global phenomenon
- Much indigenous African music (e. g. Burundi drumming)
- Music of the Tuvan horse culture (see, for example, the documentary *Genghis Blues*).

In short, skipple pulse is second only to duple/quadruple in pervasiveness *worldwide— ahead of triple pulse*.

If you've had formal music theory, it's unlikely your instructors gave skipple pulse much of a mention, except perhaps in a discussion of swing or shuffle.

Skipple pulse plays a central role in popular music. A good grasp of skipple pulse will help you a lot in your songwriting efforts. Skipple has a distinctive uneven gait. *Songs with skipple pulse tend to grab the ear.*

In all three pulse types, the first beat gets the accent. What distinguishes the accented beat in skipple pulse is that it persists for *twice the duration* of the unaccented beat. Skipple has the effect of propelling you forward. It gets you moving and dancing.

To get a sense of skipple, try this when no one's around—you don't want them to think you've lost your mind:

- Remember when you were five years old and you would skip along the sidewalk? Step with left foot, hop with left foot, step with right foot, hop with right foot. STEP-hop, STEP-hop, STEP-hop, STEP-hop ... Go ahead, try it. Indoors with the curtains drawn. Skip around the room. Watch out for the cat.

- As you skip around like a fool (but who cares, nobody's watching), you'll notice that the "STEP" takes *twice as long* as the "hop."

- While you're at it, you can sing some songs in skipple pulse, songs that you learned way before you started school. Songs such as "Ring Around The Rosy" and "Pop Goes The Weasel" and "The Farmer In The Dell." In all of these songs, you can easily feel the skipple pulse.

Of the three pulses, skipple most closely resembles your heartbeat:

thuummp-a thuummp-a thuummp-a thuummp-a

Mashing Duple and Triple Yields Skipple

Skipple embodies both duple and triple pulse, without being either. When you mash duple and triple, you get skipple.

- Here's a duple pulse, which has two beats of equal duration, the first of which is accented:

Accents	●	•
Counted Beats	1	2

- Here's a triple pulse, which has three beats of equal duration, the first of which is accented:

Accents	●	•	•
Counted Beats	1	2	3

- When you mash duple and triple together, you get skipple pulse, which technically has three beats, the first of which is accented and the second *silent*. The effect is that the first beat is *doubly accented*. It's both louder and longer in duration than the third beat:

Accents	●		•
Counted Beats	1	2	3
	Step		hop

Embedded Skipple Pulses

Skipple pulses usually chunk into groups of four. Each skipple pulse is *embedded* in a single "big" beat, like this:

Accents	● •	● •	● •	● •
Counted Beats	1	2	3	4

Skipple pulses also chunk into groups of three, each embedded in a single beat, like this ("jazz waltz"):

Accents	● •	● •	● •
Counted Beats	1	2	3

When skipple pulses are present in a song, they are *almost always embedded in duple or triple pulses*, as indicated in the above diagrams (there are some unusual exceptions). So whenever you hear the characteristic *thuuummmp-a thuuummmp-a* of skipple pulse in a song, you're actually hearing *two types of pulses simultaneously:*

- On the "micro" level—the level of the individual beat—the pulse is skipple.
- On the "macro" level—the level of grouped beats—the pulse is duple, quadruple, or triple.

With embedded skipple pulses, the effect sounds far different from ordinary duple or triple pulse.

BEETHOVEN: BARRELHOUSE/BOOGIE COMPOSER

Beethoven's last piano sonata, Opus 111 (1821-22), has a fantastic barrelhouse/boogie-woogie section, probably the first ever committed to paper. It's an example of skipple-pulse piano style at its finest. To hear it, go to this link:

www.LVBeethoven.com/Oeuvres/Music_MidiSonatasPiano.html

Scroll to the bottom of the page, where you'll find two midi files of the entire 21- to 24-minute sonata (depending on how fast it's played), each sequenced by a different musician. Click on either one to hear the sonata. When it starts playing, grab the slider and whip it over to about 60% of the way through the piece. The

boogie-woogie section is really obvious and lasts about two minutes. It's pretty funny.

7.4.4 ARE THERE ANY OTHER PULSES?

No. Other pulse-wannabes have these problems:

- **Accent on the wrong beat.** For instance, suppose you turn skipple around, like this:

Accents	•	●	
Counted Beats	1	2	3

  If you clap your hands to this pulse, you soon notice that the second, longer beat, sounds like a powerful echo of the first, short beat. After a short while, this pulse becomes indistinguishable from skipple.

  What's goin' on? The double-length duration of the second beat carries a heavier accent by virtue of its duration than the first beat carries by virtue of its position. So your brain tends to "flip it over" into standard skipple. The first note then acquires a double accent (loudness and duration). So skipple's the natural pulse; its inverse is not.

- **More than three beats.** Suppose you try a pulse like this:

Accents	●			•
Counted Beats	1	2	3	4

  Here, the first beat is *triple* the duration of the second beat, not double. This pattern is sometimes called *shuffle*, although there's no general agreement. Some folks refer to skipple as shuffle.

  The number of beats inherent in the above pulse-wannabe is four, which is divisible by two. Your brain senses it's *binary* nature and promptly breaks it down into two duple pulses. (More on the importance of binary structure in songwriting in Chapter 8.)

The thing to remember about pulses is that they are the smallest beat *chunks* that your brain recognizes in any sequence of beats. By definition, a pulse is a group of beats in which one beat is accented. So, clearly, a pulse must be comprised of at least two beats. But a pulse cannot have more than three beats because your brain chunks four or more beats into pulses of two or three. So there can only be three pulse types: duple, triple, and skipple.

7.5
Meter and Time Signature

7.5.1
What Meter Is and How it Works

As discussed above, when your brain hears a train of beats, it automatically groups the beats into pulses. Beats have no accents and are not inherently "musical." (In a sense, "beat" in rhythm is analogous to the chromatic scale in melody and harmony.) Your brain automatically groups beats into pulses. Pulses have accents. Performers play music in pulses, not beats.

Pulse Chunking

Your brain groups pulses into larger chunks called *bars* or *measures*. A bar (or, in America, a measure) may be comprised of one, two, or three pulses. Most commonly, it's two pulses.

For example, instead of hearing a sequence of duple pulses (ONE-two ONE-two, etc.), you perceive *pairs* of duple pulses as larger chunks (ONE-two-THREE-four).

European classical composers came up with a method of notating chunks of pulses, which became known as "meter." But European composers did not *invent* meter. Darwinian natural selection invented meter. The human brain spontaneously chunks beats into pulses and pulses into bars (measures). A musician playing by ear and improvising a piece of music often has no idea that a formally-trained composer or songwriter would code the pulse groupings he or she is playing into measures of, say, four beats (two duple pulses). North American aboriginal people, for example, were drumming and dancing and singing in measures of two duple pulses (and other pulse types) for thousands of years before the European invasion.

7.5.2 How Beat, Pulse, and Meter Relate to Each Other

Some musicians equate pulse with meter, just as some equate beat with pulse. Not a good idea in either case. Occasionally, pulse and meter do coincide, in which case you can say that the pulse *is* the meter. But most of the time, meter consists of a *group* of pulses.

To summarize so far (Figure 129):

FIGURE 129 How Beat, Pulse, and Meter Relate to Each Other

2 or 3 ***beats***	> chunk into	***pulses***	> which chunk into	***meter***

In speech, something similar occurs. Two words, such as "metal" and "worker," group like two duple pulses. Individually, each word has the same accent pattern:

METal . . . WORKer

But when you combine these two words into a *single word*, "metalworker," the syllable "met" gets the primary accent, and "work" gets the secondary accent (the stronger accents take the form of slightly higher pitch):

Accents	●	•	●	•
Syllables	met-	al-	work-	er

In music, a grouping of pulses like this is called a *bar* or *measure*:

Accents	●	•	●	•
Counted Beats	1	2	3	4

Pulse and meter coincide when three beats chunk, as in "Blue Danube"-type waltz meter. This is both a single pulse *and* a single bar or measure:

Accents	●	•	•
Counted Beats	1	2	3

Triple pulses can chunk into larger metrical units, such as this one, commonly called 6/8 time (more on time signatures momentarily), which consists of two triple pulses:

Accents	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6

and this one, commonly called 9/8 time, which consists of three triple pulses:

Accents	●	•	•	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6	7	8	9

Unlike triple pulse, skipple pulse *almost always embeds* within single beats of duple pulses ...

Accents	● •	● •	● •	● •
Counted Beats	1	2	3	4

... or triple pulses:

Accents	● •	● •	● •
Counted Beats	1	2	3

7.5.3
HOW TIME SIGNATURE WORKS: MERELY A SILENT NOTATIONAL CONVENIENCE

At the beginning of a piece of notated music, you see what looks like a fraction, such as:

$$\frac{3}{4}$$

It's not a fraction. It's the *time signature* of the piece, and it gives you a clue about the beat, pulse, and meter. Only a clue, though. It does not tell you everything you need to know.

Sometimes the time signature is erroneously called the "meter signature." That leads to confusion about the difference between meter and time signature.

So, what *is* the difference between meter and time signature?

- *You can hear meter* because it consists of pulses. Musicians play pulses.

- *You cannot hear time signature.* Time signature exists only on paper (or computer screen) as a convenient way of notating information about beat, pulse, and meter.

Suppose, for example, you see the following time signature at the beginning of a lead sheet:

$$\frac{4}{4}$$

What does it mean?

First, as mentioned, it's *not* a fraction: it does *not* mean "four divided by four."

- In 4/4 meter (also called "4/4 time"), the time signature tells you that the notated music divides time into bars (or measures) of four beats (the top number), and that a certain type of note, called a quarter-note (bottom number) is the *time-value* of one beat. The bottom number gives you a clue about how fast to play the music. Generally, the larger the bottom number, the shorter the time value of each note; hence, the faster the composer wants you to play the music.

- In 3/4 time, the top number tells you that each bar has three beats. The bottom number provides the same information as in 4/4 meter—it indicates the time-value of each beat.

The thing to keep in mind about time signatures is that, because a time signature only exists on paper, you can notate a piece of music *on paper* in *any* time signature that suits your fancy (if you happen to know how to notate music). If you do it correctly, and if the musicians play it correctly, it will sound "correct" to the listener, *regardless of which the time signature you use.*

For instance, "The Star Spangled Banner" is usually notated in 3/4 time. However, you could notate it in 3/2 time or 3/8 time. If you correctly follow the

rules of notation, and if the players interpret it correctly (*including the notation of tempo*, which would vary with each time signature in order to ensure the music would be played at the same tempo, regardless of time signature), the song will sound exactly the same to listeners, whether the music is notated in 3/4, 3/2, or 3/8 time.

If you really knew what you were doing, you could even notate "The Star Spangled Banner" in 5/4 time and make it sound to listeners as though it were in 3/4 time—provided the musicians playing the piece knew what *they* were doing (all the while cursing you for your notational eccentricity).

As you'll see shortly, if you want to, you can divide a metronome's ticks into bars of, say, five or seven beats. But you have to make a conscious effort to make such groupings sound coherent. And even when you do, your brain still breaks these large groupings into pulses of two or three beats.

7.6 Varieties of Meter

There are four varieties of meter, each representing different combinations of pulse type and number of pulses to the bar:

- Simple meter
- Compound meter
- Combined meter
- Irregular meter

7.6.1 TYPES OF SIMPLE METER

A single duple pulse is called *simple duple meter:*

Accents	●	•
Counted Beats	1	2

A pair of duple pulses is called *simple quadruple meter,* the most common meter in music:

Accents	●	•	●	•
Counted Beats	1	2	3	4

A single triple pulse is *simple triple meter:*

Accents	●	•	•
Counted Beats	1	2	3

Table 54 below lists the characteristics of simple meter, and examples of classic songs.

TABLE 54 **Simple Meter: How Beat, Pulse, and Time Signature Relate to Each Other**

	Simple Duple/Quadruple Meter	Simple Triple Meter
Overview	• A **measure** consists of **one duple pulse** (=simple duple meter) **or two duple pulses** (=simple quadruple meter) • In simple duple meter (1 pulse, 2 beats), the 1st beat gets a stronger accent than the 2nd beat: ***1*** - 2 • In simple quadruple meter (2 duple pulses, 4 beats), the 1st beat gets a strong accent and the 3rd beat a weaker accent: ***1*** - 2 - *3* - 4	• A **measure** of simple triple meter consists of **one triple pulse** • The 1st beat gets an accent: ***1*** - 2 - 3
Time Signature	• The **top number** in the time signature is ***always* 2 or 4** • Popular time signatures: $\frac{2}{4}$ $\frac{4}{4}$ • Other time signatures: $\frac{2}{2}$ $\frac{2}{8}$ $\frac{4}{2}$ $\frac{4}{8}$	• The **top number** in the time signature is ***always* 3** • Popular time signatures: $\frac{3}{4}$ $\frac{3}{8}$ • Other time signature: $\frac{3}{2}$

Examples	• **Most songs** in popular music are in **simple quadruple meter** (4/4), known popularly as "4/4 time" or "common time." • **Fast polkas** are normally in duple meter (2/4), known popularly as "2/4 time."	• Simple triple meter is basic **waltz meter** ("3/4 time"). • **Classic songs:** "She's Leaving Home" "El Paso" "Tennessee Waltz" "Dark As A Dungeon" "Moon River" "Blue Danube" "God Save The Queen"/"My Country 'Tis Of Thee"

Simple 4/4 is humankind's default meter. Most popular songs are in 4/4.

7.6.2
TYPES OF COMPOUND METER

Compound meter refers to a group of *two or more triple pulses*. You can chunk triple pulses into groups of two, like this (*compound duple* meter):

Accents	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6

Or groups of three, like this (*compound triple* meter):

Accents	●	•	•	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6	7	8	9

Or groups of four, like this (*compound quadruple* meter):

Accents	●	•	•	●	•	•	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6	7	8	9	10	11	12

Table 55 below summarizes compound meter and lists some examples of classic songs.

TABLE 55 Compound Meter: How Beat, Pulse, and Time Signature Relate to Each Other

	Compound Duple/ Quadruple Meter	Compound Triple Meter
Overview	• A **measure** consists of **two triple pulses** (=compound duple meter) or **four triple pulses** (=compound quadruple meter) • In compound duple meter (2 triple pulses), the 1st beat gets a strong accent and the 4th beat a weaker accent: ***1***-2-3 - *4*-5-6 • In compound quadruple meter (4 triple pulses), the 1st beat gets a strong accent and the 4th, 7th, and 10th beats get weaker accents: ***1***-2-3 - *4*-5-6 - *7*-8-9 - *10*-11-12	• A **measure** of compound triple meter consists of **three triple pulses** • The 1st beat gets a strong accent and the 4th and 7th beats get weaker accents: ***1***-2-3 - *4*-5-6 -*7*-8-9
Time Signature	• The **top number** in the time signature is ***always* 6 or 12** • Popular time signatures: 6/4 6/8 12/8 • Other time signatures: 6/16 12/4 12/16	• The **top number** in the time signature is ***always* 9** • Popular time signature: 9/8 • Other time signatures: 9/4 9/16
Examples	• **Classic songs:** "Norwegian Wood" "When A Man Loves A Woman" "Can't Help Falling In Love" (especially Elvis Presley's version) "House Of The Rising Sun" (the rendition by The Animals is a good one) "Memory" (from the musical, *Cats*) • Slow jigs	• **Classic songs:** "The Impossible Dream" "Send In The Clowns" "Beautiful Dreamer" "Jesu, Joy Of Man's Desiring" • Slow slip jigs

7.6.3
COMBINED METER

Combined meter, as the name suggests, combines two different pulse types, namely, *skipple pulses* and either duple or triple pulses.

Combined duple meter consists of two "macro" beats, which chunk into one duple pulse. Each macro beat is itself comprised of one skipple pulse. So you have two skipple pulses *embedded* within a single duple pulse. Like this:

Accents	● ·	• ·
Counted Beats	1	2

Combined triple meter consists of three macro beats, which chunk into one triple pulse. Each macro beat is comprised of one skipple pulse. So you have three skipple pulses embedded within a single triple pulse:

Accents	● ·	• ·	• ·
Counted Beats	1	2	3

Combined quadruple meter consists of four macro beats, which chunk into two duple pulses. Each macro beat is comprised of one skipple pulse. So you have four skipple pulses embedded within two duple pulses.

> **This is the most common meter in blues, jazz, R & B, soul, gospel, and hip-hop.**

Accents	● ·	• ·	• ·	• ·
Counted Beats	1	2	3	4

Important Note on Time Signature and Combined Meter

With simple and compound meter, the time signature tells you something about the beat, pulse, and meter. ***Not so with combined meter.***

Time signatures only provide information about simple meter and compound meter. *They do not tell you anything about combined meter*, which contains embedded skipple pulses.

A song in combined meter may be notated in *any simple or compound time signature:* 3/4, 4/4, 6/4, 6/8, 9/8, 12/8, you name it.

Immediately, then, you wonder:

- When you see a lead sheet in, say, 4/4 time (according to the time signature), how do you know whether it's simple meter (two duple pulses) or combined meter (two duple pulses comprised of four embedded ***skipple*** pulses)? It could be either.

- If it's in 6/8 time, how do you know if it's compound meter (two triple pulses) or combined meter (two skipple pulses)? It could be either.

- If it's in 3/4 time, how do you know if it's simple meter (one triple pulse) or combined meter (three skipple pulses)? It could be either.

The short answer is, you can't tell just by looking at the time signature. Occasionally, the songwriter lets you know at the top of a lead sheet with this notation:

When you see this, the songwriter or arranger clearly wants you to play skipple pulses. So if the time signature is 4/4, you would play four skipple pulses to the bar instead of two duple pulses (four beats) to the bar.

Table 56 summarizes how combined meter differs from both simple meter and compound meter. Find (or download) and listen to some of the examples listed in the table (nearly all are on the *Gold Standard Song List*). The examples will provide you with a good feel for combined meter and how it differs from simple meter and compound meter.

TABLE 56 Combined Meter: How Beat, Pulse, and Time Signature Relate to Each Other

	Combined Duple/ Quadruple Meter	Combined Triple Meter
Overview	• A **measure** consists of **two skipple pulses** (combined duple meter) or, much more commonly, **four skipple pulses** (combined quadruple meter). • In combined duple meter, there are 2 "macro" beats to the bar. Each macro beat is comprised of one skipple pulse. So the 2 skipple pulses are "embedded" within the macro duple pulse. • In combined quadruple meter, there are four macro beats to the bar. Each macro beat is comprised of one skipple pulse. So the 4 skipple pulses are embedded within the 2 macro duple pulses.	• A **measure** of combined triple meter consists of **three skipple pulses.** • There are 3 "macro" beats to the bar. Each macro beat is comprised of one skipple pulse. So the 3 skipple pulses are "embedded" within the macro triple pulse.
Time Signature	• The **top number** in the time signature is ***always*** **2, 4, 6 or 12** • Popular time signatures: $\frac{2}{4}$ $\frac{4}{4}$ $\frac{6}{4}$ $\frac{6}{8}$ $\frac{12}{8}$ • Other time signatures: $\frac{2}{2}$ $\frac{2}{8}$ $\frac{4}{2}$ $\frac{4}{8}$ $\frac{6}{16}$ $\frac{2}{4}$ $\frac{12}{16}$	• The **top number** in the time signature is ***always*** **3 or 9** • Popular time signatures: $\frac{3}{4}$ $\frac{3}{8}$ $\frac{9}{8}$ • Other time signatures: $\frac{3}{2}$ $\frac{9}{4}$ $\frac{9}{16}$

Examples	• **Classic songs:** "London Calling" "Albert Flasher" "The Needle And The Damage Done" "Waterloo" (ABBA) "Crazy" (Patsy Cline's recording) "Help Me, Rhonda" "Lilli Marlene" "King Of The Road" "Liberty Bell March" (Monty Python theme) "Return To Sender" "God Bless America" "Christopher Robin At Buckingham Palace" "Waltzing Matilda" "Pink Panther Theme" "Let's Call The Whole Thing Off" • Countless jazz, blues, R & B, soul, gospel, and hip-hop classics • Many early rock and rockabilly classics ("All Shook Up," "Reelin' And Rockin'," "That'll Be The Day," etc.) • Fast jigs • Much bhangra dance music	• **Classic songs:** "Still Crazy After All These Years" "I'm So Lonesome I Could Cry" (Hank Williams, Sr. version) "You Make Me Feel Like A Natural Woman" "If You Don't Know Me By Now" "Rocky Road To Dublin" "Amazing Grace" "Only Love Can Break Your Heart" (Neil Young) • Fast slip jigs

You can change the arrangement of most songs from simple or compound meter to combined meter. Or vice-versa.

How Double Skipple Pulse Works in Hip-hop

Much hip-hop music seems to be in simple duple/quadruple meter. Yet it's actually combined meter, with fast double skipple pulses embedded in slower "macro" beats (e.g., "California Love" by 2Pac & Dr. Dre; "Hey Lover" by LL Cool J & Boyz II Men).

Accents	● •	● •	● •	● •	● •	● •	● •	● •
Counted Beats	1		2		3		4	

Lyrically, you can cram as many as 24 syllables into a single bar. Some hip-hop lyricists do exactly that (see Chapter 10).

You will find this type of combined meter, played at a fast clip, everywhere in bhangra.

7.6.4
IRREGULAR METER

Your brain recognizes only three types of pulse: duple, triple, and skipple. Grouping "like" pulses together—duple with duple, triple with triple, skipple with skipple—results in various types of simple, compound, and combined meter, as discussed above.

But if you combine a *mixture* of pulses to create measures of five, seven, ten, eleven, or thirteen beats, your brain has to work pretty hard at tracking the oddly grouped beat sequences, called *irregular meter.*

To simplify the task, your brain chunks the beats into mixed patterns of two-beat or three-beat pulses. For example:

- Measure of 5 beats = 2+3 or 3+2

- Measure of 7 beats = 4+3 or 2+2+3 or 3+4 or 3+2+2, etc.

With the exception of jazz, not much Western popular and classical music is written in irregular meter. In the musical traditions of some countries, such as Turkey, India, and Greece, irregular meter is more common, although the *measures* then tend to group into twos, fours, and multiples of four.

Table 57 summarizes the main characteristics of irregular meter.

TABLE 57 Irregular Meter: How Beat, Pulse, and Time Signature Relate to Each Other

	Irregular Meter
Overview	• A **measure** consists of a **mixture** of duple and triple pulses.
Time Signature	• Typically, the **top number**—the number of beats per bar—is not divisible by 3 or 4. • Some time signatures include: $\frac{5}{4}$ $\frac{7}{4}$ $\frac{7}{8}$ $\frac{10}{8}$ $\frac{11}{8}$
Examples	• **Classic songs:** "Take Five" (Paul Desmond/Dave Brubeck Quartet) "Money" (Pink Floyd) "Mission Impossible Theme" (Lalo Schifrin; the original version) "Have A Good Time" (Paul Simon)

As with simple or compound meter, you can also turn each beat into a skipple pulse, creating *combined irregular meter*. "Take Five" and "Money" are well-known examples.

THE "BREWSKI" METHOD OF COPING WITH UNUSUAL METER

If you have trouble counting in an uncommon meter such as 7/8, 9/8, or 5/4 meter, try the "brewski" method. Use a phrase with strong accents that match the chunked metrical divisions. For instance:

- To count in 7/8 time, say, "**NOW**-I-can-**HAVE**-a-**BREW**-ski," which chunks 7/8 meter into 3-2-2. If the chunking is 2-2-3, you have to start the phrase at a different place. For example, Pink Floyd's "Money" is chunked 2-2-3, so you have to say, "**HAVE**-a-**BREW**-ski-**NOW**-I-can."
- In 9/8 time, say, "**NOW**-I-can-**HAVE**-me-a-**NOTH**-er-one."
- In 5/4 time, it's just "**NOW**-I-can-**HAVE**-a." Try this one with "Take Five."

In 1959, jazz alto sax genius Paul Desmond demonstrated how to swing in irregular meter. As a member of the Dave Brubeck Quartet, Desmond wrote and recorded "Take Five," one of the great classics of jazz. "Take Five" combines skipple pulse on every beat with irregular measures of five beats, chunked into one triple and one duple pulse. The skipple pulses are embedded like this (one measure):

Accents	● •	● •	● •	● •	● •
Counted Beats	1	2	3	4	5

Pink Floyd's "Money": How and Why It Works Brilliantly

Pink Floyd's "Money" also combines skipple pulse with irregular meter, but "Money" has seven-beat measures instead of five-beat measures. Written by Roger Waters for the group's 1973 album *Dark Side of the Moon*, "Money" stands as one of the greatest, most original classics in rock history.

If you've never studied how this masterpiece works, now's the time. Saddle up. You will learn a lot about what goes into the creation of an immortal song, a song that soars miles above the vast ocean of pop mediocrity.

If you don't have the words and lyrics for "Money," go fetch 'em so that you can follow the discussion below. You'll need the original recording from *Dark Side of the*

Moon. If you don't already have it, you can download it for a buck at iTunes or PureTracks or Yahoo! or any other legal vendor.

Also, get the lyrics: go to www.GoldStandardSongList.com and click on "How to Get Lyrics" (under "Basics").

Listen to the song once or twice, and follow the lyrics to refresh your memory. Now you're ready.

Here are some of the reasons "Money" has been wildly successful for decades, both commercially and artistically.

1. **Seven-beat meter that works.** Practically unheard-of in successful rock music. The irregular meter is the first thing that catches your brain's attention, the first thing that makes "Money" stand out against the overwhelming majority of popular songs, which are in regular meter. Some songwriters take a stab at irregular meter, but hardly any succeed in making it work. Here's why seven-beat meter succeeds in "Money":

    - ***Clear chunking.*** The seven-beat measures are clearly chunked into two duple pulses followed by one triple pulse. No ambiguity. If you want to make irregular meter work (five- or seven-beat), you have to be absolutely clear about the chunking right from the beginning.

    - ***Embedded skipple pulses on every beat.*** From the beginning of "Money" (after the opening cash register bit) the bass repeats a sequence of eight notes to the bar, one on each beat *except* for the third beat, which gets two notes, played as a skipple pulse. NOTE:

        1. The bass is the first instrument you hear. It begins on the *second* note of the measure, not the first.

        2. The black dots in the diagrams below represent pulses and accents only, not pitch:

Bass accents	●	•	● •	•	●	•	•
Counted Beats	1	2	3	4	5	6	7

That skipple pulse on the third beat, repeated in every bar, is crucial, because it signals that this song is in *combined* irregular meter, not just ordinary irregular meter. This metrical characteristic—combined meter, with skipple pulses on every beat—is another element that sets "Money" apart from the great majority of popular songs, which are in simple meter (no skipple pulses).

As the other instruments join the bass, they reinforce the fact that each beat is actually a skipple pulse. None of the instruments plays skipple pulses on every beat—only on one or two beats per seven-beat measure. That's all it takes. As well, the *vocal,* when it comes in, contributes skipple pulses once or twice per measure.

This is one of the most important characteristics of skipple pulses: they are so distinctive and powerful that it's *not necessary* (and often not desirable) to play skipple pulses on every beat to establish the propulsive skipple feel. "Money"commendably walks the line. The voice, bass, guitar, keyboards, sax, drums—each contributes skipple pulses once or twice per measure. That's enough to keep the skipple feel of the meter alive throughout the song. If one or two (or more) of the players had played skipple pulses on every beat throughout the song, it would have overwhelmed the rhythm and ruined the arrangement.

Here's a metrical picture of one of the verses. Note that the first word, "Money," begins on the *second* beat of the measure, not the first beat. This is one way of thwarting rhythmic prediction, making the word "money" stand out:

Accents	● •	● •	● •	● •	● •	● •	● •
Counted Beats	1	2	3	4	5	6	7
Lyrics	*Get* *I'm* *my*	*Mon-* *back* *al-*	*ey* *right,* *stack*	*Jack,*	*Keep your*	*hands*	*off of*

Whenever two syllables appear on one beat, they're sung as a skipple pulse: in the above example, *keep your* and *off of.* This happens in all of the verses, reinforcing the skipple feel.

2. **Successful changes of meter.** Few popular songs change meter abruptly mid-song. This one does it with ease. It's another characteristic of "Money" that sets this song apart from the mass of songs. At about the three-minute mark, partway through the instrumental bridge, the song smoothly transitions from seven beats to four beats per bar: combined quadruple meter. The skipple pulses remain on every macro beat. The meter switches back to seven beats at the end of the instrumental section, then switches again to four beats at the end of the last verse.

3. **Successful changes of tempo.** Few popular songs change tempo abruptly mid-song. "Money" does. The song begins at about 118 beats per minute (BPM) and gradually drifts up to about 126 BPM by the two minute mark, where it remains for the next 60 seconds or so. Then, at the same time as the song changes meter from seven to four beats per bar, the tempo also suddenly speeds up to about 136 to 138 BPM. The combination of change of meter and simultaneous abrupt increase in tempo is startling, to say the least. At the end of the long instrumental bridge, the meter returns to seven beats and the tempo slows down somewhat to about 126.

4. **Minor mode.** Few songwriters have the nerve to write in the minor mode. Too bad. As noted in Chapter 5, the minor mode is emotionally powerful. Songs in minor keys such as "Money" (the recording is in the key of B minor), grab the ear because they stand out against the great majority of popular songs, which are in the major mode.

5. **Appropriately simple chord progression.** With so much unusual stuff going on with the meter and tempo, the songwriter wisely decided to keep the harmony simple and straightforward. The song has only three simple chords—the three principal chords of the minor key.

6. **Superior melody.** See Chapter 9.

7. **Sharp, focussed, satirical lyrics.** See Chapter 10.

In short, Roger Waters got practically everything right with "Money," everything needed to set this song apart from what you usually hear on rock radio. No wonder *Dark Side of the Moon* has sold tens of millions of copies since 1973, and continues to sell in the hundreds of thousands every year.

7.6.5 RELATIVE POPULARITY OF THE FOUR TYPES OF METER

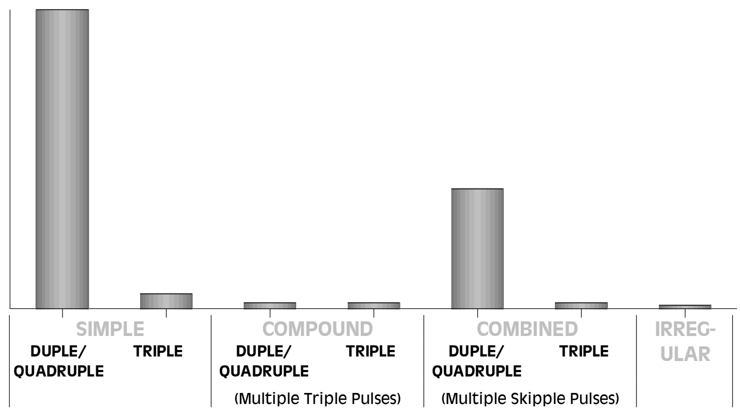
Songs in simple quadruple meter ("4/4 time") are far and away more numerous than songs in all other varieties of meter put together. That doesn't mean simple quadruple is *better* than the others. It's simply the easiest to play and most accessible for listeners. It's the default meter.

Songs in combined meter are more prevalent in popular music than songs in compound meter. Despite this, music schools and instructors teach students about

simple meter and compound meter, but rarely recognize combined meter in its own right.

If you were to randomly sample a large number of recordings of great songs in a variety of genres—hip-hop, pop, rock, folk, jazz, blues, country—from, say, 1900 to 1999, you would probably get a relative distribution of the popularity of meter types that would look something like Figure 130.

FIGURE 130 Relative Popularity of Meter Types (An Approximation)



A lot of songwriters gravitate to simple quadruple out of *ignorance* about the other metrical possibilities—especially combined meter.

So, if you want your songs to stand out ... make a deliberate effort to write more songs in meters *other than simple quadruple*.

The most naturally driving, forceful meter is not simple quadruple. It's *combined* quadruple.

Combined Quadruple: Not the Most Common, but the Coolest Meter

As previously mentioned, combined quadruple is the signature meter of African American genres: jazz, blues, R & B, soul, hip-hop. It's not nearly as pervasive in rock, country, and folk. It's rare in dance/electronica.

The defining characteristic of combined meter is the embedded skipple pulse on every macro beat, skipple being the only pulse-type with a *double accent:*

1. ***Metrical position accent.*** The first beat of any pulse type, including skipple, is the accented beat.

2. ***Duration accent.*** Sounds of long duration are more emphatic than sounds of short duration. In skipple pulse, the first beat is twice the duration of the second. Technically, this is called *agogic accent.*

Powerfully-accented skipple pulses have a lot of inherent drive or propulsion, even at slow tempos.

In the 1960s and 70s, many a rock songwriter with a strong affinity for the blues wrote great songs in combined quadruple. Brian Wilson, for instance: "California Girls," "Help Me, Rhonda," "Good Vibrations," "Wouldn't It Be Nice" and others. Eric Clapton's acoustic version of "Layla" is in combined quadruple meter, unlike his original electric version (simple quadruple).

Here are some Lennon-McCartney songs in combined quadruple. The variety is breathtaking.

"All You Need Is Love"
"Being For The Benefit Of Mr. Kite"
"Can't Buy Me Love"
"Fixing A Hole"
"Happiness Is A Warm Gun"
"I Am The Walrus"
"Maxwell's Silver Hammer"
"Oh! Darling"
"Penny Lane"
"Revolution"
"This Boy"
"When I'm Sixty-four"
"With A Little Help From My Friends"
"Yellow Submarine"
"Your Mother Should Know"

Lennon and McCartney used combined quadruple meter much more often in the last four years of their songwriting partnership than in the first four years.

Bob Dylan also wrote many classics in combined quadruple. Granted, it's his lyrics that have defined him as one of the greatest songwriters of all time. But it didn't hurt that he also chose the coolest meter—combined quadruple—as the metrical setting for some of those lyrics.

Here are a few of Dylan's combined quadruple meter songs (all written in the 1960s, when the songwriter was in his early and mid twenties):

"It Takes A Lot To Laugh, It Takes A Train To Cry"
"Ballad Of A Thin Man"
"Highway 61 Revisited"
"Rainy Day Women #12 & #35 (Everybody Must Get Stoned)"
"Leopardskin Pillbox Hat"
"Just Like A Woman"
"Sad-Eyed Lady Of The Lowlands"
"This Wheel's On Fire"
"Dear Landlord"

To get a feel for how Dylan uses combined quadruple meter, skipple on over to www.BobDylan.com. There you can listen to audio samples of hundreds of his recordings.

The original, first recordings of the songs listed above are in combined quadruple meter, so listen to them first. Then listen to later recordings of the same tunes, usually linked just below the originals. Many are *not* in combined quadruple.

For instance, the original recording of "It Takes A Lot To Laugh, It Takes A Train To Cry," from the album *Highway 61 Revisited*, is in combined quadruple. This is the soulful, blues-infused rendition. Compare it with Dylan's version of the same song from *The Bootleg Series, Volumes 1-3*, recorded 26 years later. It's much faster, and Dylan has changed the meter to *simple quadruple*, a straight-ahead rock interpretation.

7.7 Tempo

7.7.1 What Tempo Is and How it Works

Tempo refers to the speed at which you play a piece of music. A notation of tempo can refer to the speed in beats per minute (simple or compound meter) or the speed in pulses per minute (embedded skipple pulses in combined meter).

At the beginning of a notated song in 4/4 time, you might see this:

♩ = 120

which simply means, "Play this song at 120 BPM." Which could mean either 120 *beats* per minute or 120 *skipple pulses* per minute.

If the same piece of music were notated in 6/8 time, you might see this:

♪ = 120

which means, "Play this song at 120 BPM." Exactly the same. But the feel of the meter would be different from simple quadruple, because 6/8 means triple pulses instead of duple pulses.

7.7.2
HOW TEMPO AFFECTS METER

Recordings of popular songs tend to have a pretty narrow tempo range, usually about 110 to 140 BPM. This range amounts to the "default tempo" of popular music.

In the recording process, producers sometimes obsess about maintaining a rock-steady tempo throughout the recording of a song. More for technical than artistic reasons. That is, if the tempo varies on the bed tracks, then players and singers doing overdubs could have problems playing or singing in sync. The decades-old studio method of maintaining an unchanging tempo is to first record a click track, a digital-metronome track.

Usually, it's not necessary. Consider "Money," for instance. In the first two minutes, it speeds up by roughly 8 BPM, then leaps *another* 12 BPM. Then it slows down noticeably again during the last couple of minutes. All those tempo changes didn't affect the song's success. The leap of 12 BPM in the middle clearly made the song more appealing.

Tempo changes within a piece of music are usually slow—a gradual increase in tempo (*accelerando*), or a gradual decrease (*ritardando*). However, if there's a large tempo change, it almost invariably occurs in a simple ratio: the beat doubles or it halves. Or a halved tempo triples.

If the music does not expressly call for accelerando, as in Joe Cocker's interpretation of "With A Little Help From My Friends," or ritardando, as in Gordon Lightfoot's "Canadian Railroad Trilogy" (which also has accelerando), then playing at a steady tempo is, supposedly, a mark of skilled musicianship.

Unintentionally speeding up is called *rushing.* Unintentionally slowing down is *dragging.*

What happens to the meter when you decide to perform a song from beginning to end at a completely different tempo than, say, the original recording?

Significantly changing the tempo can actually *change the meter*.

Changing the meter greatly affects how the whole song sounds, even when it's the same vocalist, same players, same instruments, same lyrics.

If you do this intentionally, fine. But if you *don't* want to change the overall feel of a song, you have to be careful about making radical changes to the tempo, changes that go beyond minor rushing and dragging. You might inadvertently change the meter.

On the other hand, maybe you *do* want to change the feel of a tune.

Maybe it sounds too mechanical or march-like. Reducing the BPM could help you achieve a more soulful sound by enabling you to switch from, say, simple quadruple meter to combined quadruple meter, embedding a skipple pulse on every beat.

Radical tempo changes have noticeable effects because they reflect changes in the number of beats your brain can process per unit of time.

- At slow tempos, your brain can track more individual beats and pulses than it can at fast tempos.

- At fast tempos, the beats start to blur until your brain finds it more comfortable to convert, for example, three-beat pulses into two-beat pulses. Or four-pulse measures into two-pulse measures.

Try counting to eight out loud in two seconds. It's easy. Now try counting to 16 in two seconds. It's a lot harder unless you kind of slur through all the even numbers.

Change of meter as a direct result of tempo change often happens automatically. You don't even have to change the musical arrangement.

For example, suppose you play a song at a certain tempo in compound quadruple meter:

Accents	●	•	•	●	•	•	●	•	•	●	•	•
Counted Beats	1	2	3	4	5	6	7	8	9	10	11	12

If you play the same song at a faster tempo, *without changing the musical arrangement*, your brain will convert the meter into *combined* quadruple. This is what your audience will actually hear—whether or not it was your intention:

Accents	● •	● •	● •	● •
Counted Beats	1	2	3	4

Table 58 provides some guidelines on what could happen to the meter if you speed up or slow down the tempo.

TABLE 58 How Changing the Tempo Changes the Meter

	Duple/Quadruple Meter	Triple Meter
Simple	**At a faster tempo . . .** • The meter will still be perceived as simple. You would need to make a significant effort to change it to compound or combined. **At a slower tempo . . .** • The perceived meter will not change naturally. However, you could easily change it to compound or combined.	**At a faster tempo . . .** • The perceived meter will have a tendency to shift from simple to compound or combined. **At a slower tempo . . .** • The perceived meter will not change. You would need to make a significant effort to change it to compound or combined.
Compound (Multiple Triple Pulses)	**At a faster tempo . . .** • The perceived meter will change to combined meter, then to simple meter as tempo increases. **At a slower tempo . . .** • The perceived meter will change to simple triple.	**At a faster tempo . . .** • The perceived meter will change naturally to combined meter, then to simple triple as tempo increases (with the primary accent on the 1st beat and secondary accents on the 4th, and 7th beats). **At a slower tempo . . .** • The perceived meter will change to simple triple.
Combined (Multiple Skipple Pulses)	**At a faster tempo . . .** • The perceived meter will change to simple quadruple. **At a slower tempo . . .** • The perceived meter will not change naturally. However, you could easily change it to simple triple.	**At a faster tempo . . .** • The perceived meter will change to simple triple. **At a slower tempo . . .** • The perceived meter will not change naturally. However, you could easily change it to simple triple by breaking each 9-beat measure into three 3-beat measures

7.7.3 FOUR TEMPO RANGES IN TERMS OF HUMAN LOCOMOTION

You might find it helpful to think of the tempo ranges in terms of the pace of human locomotion. Something like this:

60 BPM	± 30	"Strolling" Tempo (Slow)
120 BPM	± 30	"Walking" Tempo (Moderate)
180 BPM	± 30	"Jogging" Tempo (Lively)
240 BPM	± 30	"Running" Tempo (Fast)

Table 59 below lists the BPMs of some classic recordings. It's likely the great majority were recorded without a click track. So, if you try to sync a digital metronome to most of these recordings, you'll find that the BPM value tends to vary a beat or three during the course of the recording. Small variations of this nature always occur. Most listeners don't even notice them. They certainly don't signify inadequate musicianship.

TABLE 59 Perceived BPM Values: Recordings of Classic Songs

	Song Title	As Recorded By	BPM
60 ± 30 BPM: "Strolling" Tempo (Slow)	"Put Your Dreams Away"	Frank Sinatra	52
	"Helpless"	Neil Young	57
	"The Long And Winding Road"	The Beatles	68
	"Born To Lose"	Ray Charles	86

120 ± 30 BPM: "Walking" Tempo (Moderate)	"D-I-V-O-R-C-E"	Tammy Wynette	100
	"My Girl"	The Temptations	106
	"Sunday Bloody Sunday"	U2	110
	"Stop In The Name Of Love"	The Supremes	118
	"I Heard It Through The Grapevine"	Marvin Gaye	120
	"If You Could Read My Mind"	Gordon Lightfoot	124
	"Here Comes The Rain Again"	Eurhythmics/Annie Lennox	128
	"Wayfaring Stranger" (*Cold Mountain* soundtrack)	Jack White (White Stripes)	128
	"Takin' Care Of Business"	BTO	130
	"Lively Up Yourself"	Bob Marley	132
	"Uncle John's Band"	Grateful Dead	136
	"Rocket Man"	Elton John	138
	"Anarchy In The U.K."	Sex Pistols	138
	"The Weight"	The Band	144
	"Mame"	Louis Armstrong	150
	"Dancing In The Dark"	Bruce Springsteen	150
180 ± 30 BPM: "Jogging" Tempo (Lively)	"Fun Fun Fun"	Beach Boys	158
	"If I Had A Million Dollars"	Barenaked Ladies	160
	"We Will Rock You"	Queen	164
	"Johnny B. Goode"	Chuck Berry	166
	"Blue Skies"	Dinah Washington	170
	"Honky Tonkin'"	Hank Williams	170
	"Man Of Constant Sorrow" (*O Brother, Where Art Thou?* soundtrack)	Soggy Bottom Boys	170
	"Whole Lotta Love"	Led Zeppelin	178
	"San Antonio Rose"	Willie Nelson and Ray Price	180
	"You Can't Always Get What You Want"	Rolling Stones	182
	"Me And Bobby McGee"	Janis Joplin	186
	"Tangled Up In Blue"	Bob Dylan	200
240 ± 30 BPM: "Running" Tempo (Fast)	"The Highwayman"	Johnny Cash, Kris Kristofferson, Waylon Jennings, Willie Nelson	220
	"Wildwood Flower"	The Carter Family	228
	"Be My Yoko Ono"	Barenaked Ladies	235
	"Graceland"	Paul Simon	250
	"Viva Las Vegas"	Elvis Presley	292

Far more songs have BPM values of between about 110 and 140 than above or below this range.

This is another opportunity for you to differentiate your own songs. Write a lot of comparatively fast tunes and comparatively slow ones. They'll stand out from the mass of 110-to-140-BPM songs everybody writes by default. Just as songs in combined meter stand out from the mass of songs in simple meter.

One thing about *singing* fast tunes vs slow ones: slow tunes are less forgiving because note durations are longer. Pitchy (off-key) singing stands out. If you have

great vocal chops, you'll shine when you sing at a slow tempo—provided the song's a good one. But if you're vocally challenged, a slow-tempo effort might make your audience flee.

SLOW DOWN ... AND YOU'LL SPEND MORE

If you own a restaurant or supermarket, you can induce your customers to spend more money by playing slow-tempo background music. Slow music leads to lingering and higher spending. Customers lock into the tempo of the music they hear. So if the music's fast, they move faster and get out of the store or restaurant sooner than if the music's slow.

In the restaurant industry, the type of music matters, too. A study in Britain revealed that classical background music, with its connotations of affluence and sophistication, led to the highest spending, compared with popular music or no music.

7.7.4 How to Make Slow Tempo Seem Fast (and Vice-versa)

Suppose you're playing a tune at 120 BPM, with a natural accent every second beat. If you then have one or more rhythm instruments accent *every* beat instead of every second beat, the tempo will seem faster. This is called *diminution*. More diminution in Chapter 9.

O FAST-MUSIC DRIVER: GET A HORSE

Researchers studying the effects of music listening on driving behaviour found that the faster and louder the music in the car, the greater the probability the driver will crash. Twice as likely as a "slow-music" driver. "Fast-music" drivers tend to run red lights more often ... no doubt a contributing factor to their crash rates. And it doesn't matter what kind of music—rock, jazz, classical, dance. If the tempo of the music you're listening to while driving is fast, you're more likely to crash.

So, there you have it, up-tempo drivers. Heed the advice of Sadie and Ellie Sue: get a horse.

7.7.5 EMOTIONAL EFFECTS OF TEMPO

Tempo, like mode, has an especially intense emotional impact. In general, positive valence is associated with fast tempo, negative—especially sadness—with slow. Large deviations in tempo also tend to convey sadness, whereas rock steady tempo is associated with positive emotions (Table 60).

TABLE 60 Emotional Effects of Tempo

Tempo	Associated Emotions
Fast and flowing	Happiness
Fast	Happiness, excitement, elation, grace, fear, anger
Gentle, slow	Tenderness
Slow	Sadness, dignity, solemnity, serenity, dreaminess, sentimentality, heaviness
Little variability in tempo	Happiness, anger
Large tempo variability	Tenderness, fear

7.8
Rhythm, the Soul of Melody

7.8.1
HOW TO TELL METER FROM RHYTHM

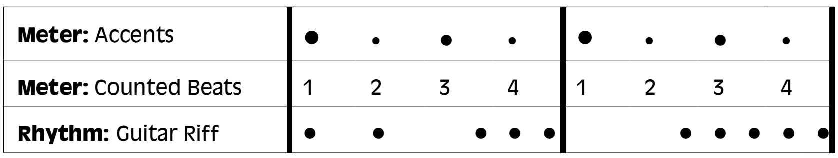
Rhythm cannot be divorced from melody. You can think of rhythm as the soul of melody.

Broadly speaking, rhythm is the aspect of music that has to do with the distribution of beats and pulses through time. But for purposes of this discussion, it's more useful to think of rhythm in a narrower, more specific sense. A rhythm pattern is an *irregular* succession of tones. You perceive rhythm as being superimposed on a steady, *regular* beat, which remains steady and regular even as beats group into pulses and pulses into meter.

In performance, normally once you establish the meter and tempo of a song in the song's 4- or 8-bar intro, the meter and tempo do not change throughout the song—unless, of course, changes in meter or tempo are part of the song's structure.

Rhythm, by contrast, consists of ***irregular*** patterns of sound—irregular, at least, over the duration of a bar or two or three or four, after which rhythm patterns usually repeat. Since the internal irregularity of rhythm patterns contrasts with the regularity of meter, rhythm patterns grab listener attention.

For example, consider the most famous guitar riff in rock, Keith Richards' riff that opens "(I Can't Get No) Satisfaction" and repeats throughout most of the song. Try this: tap out a regular beat with your hand or foot while humming the 10 notes of the riff. What you tap is *meter*; what you hum is *rhythm*. The guitar riff is an irregular pattern that repeats every two bars. Its irregularity contrasts with the uniformity of the meter, which is simple quadruple:



(The above diagram does not convey the fact that the notes of the riff *sustain* from note to note, including that big gap between the fifth and sixth notes, across the bar line for the next beat and a half. But ... you get the picture.)

In the above example, rhythm is as much *melodic* as it is temporal. The term *melodic rhythm* refers to the *temporal pattern* of a *melody*, such as the pattern of the

"Satisfaction" guitar riff. Melodic rhythm applies to any melody, whether sung or played on an instrument.

Here's a summary of some of the main differences between meter and rhythm (Table 61).

TABLE 61 Differences Between Meter and Rhythm

	Meter	Rhythm
How does it mark the flow of time?	• By repeating the same short grouping of pulses from the start of a tune to the end of it (unless the time signature changes within the piece).	• With a variety of beats in varying configurations of duration and accent, in patterns ranging from short clusters to long phrases.
How predictable is it?	• Completely predictable and uniform.	• Not generally predictable or uniform at the outset. Becomes predictable only when the whole pattern repeats.
On which beat does a group begin?	• By definition, every metrical group always begins on the first beat of the pulse grouping—the first beat of the bar.	• A rhythm pattern may begin anywhere in a measure, *on* any metrical beat or *between* metrical beats.
How do musicians communicate the pattern?	• Typically drums, bass, and guitar or keyboard communicate meter. • However, each instrument usually contributes only part of the pulse train, not all of it..	• In a band, lead and background vocalists and lead instrumentalists normally communicate a variety of rhythm patterns directly, but usually not simultaneously.
Are there gaps between groups?	• No. Normally, there are no gaps between metrical groups. Meter flows on during gaps between lead vocal and solo instrumental phrases. • If the meter stops dead for a measure or two, the brain continues to track the pulses, expecting the meter to resume within a bar or two on an appropriate and predictable beat.	• Yes, there are gaps. Vocals and lead instrumental solos do not continue without interruption, so their rhythm patterns flow and stop throughout the song. • However, some Instruments contribute rhythm patterns that continue uninterrupted throughout the song—instruments that mainly communicate meter, such as drums and bass.

The combination of drums, bass, and so-called "rhythm" guitar is called the *rhythm section*. A better term would be the "meter section" or maybe "pulse section."

A single instrument hardly ever plays *only* meter or *only* rhythm. Drummers and bass players typically play distinctive rhythm patterns while simultaneously emphasizing and maintaining the steady train of metrical pulses. By the same token, vocalists and solo instrumentalists repeat melodies in patterns that recur every bar or every few bars—patterns that become metrically predictable as a song unfolds in time, thus reinforcing the meter.

7.8.2
HOW SIMPLE RATIOS WORK IN MARKING THE FLOW OF TIME: THE LAW OF SIMPLE MULTIPLES OR FRACTIONS OF THE UNDERLYING BEAT

No matter how irregular a rhythm pattern may seem, your brain's evolved obsession with making sense of beat sequences ensures that the rhythm pattern cannot violate the following law. It's **The Law of Simple Multiples or Fractions of the Underlying Beat:**

> The durations of all the different beats in any rhythm pattern will always manifest as *simple multiples or fractions of the underlying beat*, regardless of rhythmic complexity or tempo.

For example, consider the "Satisfaction" guitar riff. It has 10 notes, distributed over eight beats as follows:

- Note 1 — 1 beat (1:1 ratio with the underlying beat)
- Note 2 — 1½ beats (3:2 ratio with the underlying beat)
- Notes 3 and 4 — ½ beat each (each at 1:2 ratio; total of 1 full beat)
- Note 5 — 2 beats (2:1 ratio)
- Notes 6 - 10 — ½ beat each (each at 1:2 ratio; total of 2½ beats)

Each of the riff's 10 notes is a simple multiple or fraction of the underlying beat.

The same law applies to gaps, called *rests*, within and between rhythm patterns. In music, every note of every duration has a corresponding rest of the same duration.

Usually, when you sit down to write a song, among the first decisions you make, whether consciously or unconsciously, have to do with meter and tempo. Most of the time, you just launch into the tune in "default" meter (simple quadruple) at "default" tempo (110 to 140 BPM).

You can play or sing any ol' irregular rhythm patterns you want, without the slightest concern about whether or not they'll correspond to the meter. The Law of Simple Multiples or Fractions of the Underlying Beat ensures that *beat, pulse, and meter will automatically emerge from whatever rhythms you concoct.*

To paraphrase E. O. Wilson, ***beat holds rhythm on a leash.*** And, paradoxically, vice-versa.

You can play funk, polka, reggae, Bo Diddley, it doesn't matter. The individual notes that make up the rhythms you play or sing manifest as simple multiples or fractions of an underlying beat that emerges automatically, along with pulse and meter.

How does this happen?

7.8.3 HOW ACCENTS "AUTOMATICALLY" COMMUNICATE BEAT, PULSE, AND METER

Some of the notes that make up a rhythm pattern are accented in one or more ways that communicate the beat:

- ***Metrical position accent:*** Strong vs weak metrical position
- ***Duration (agogic) accent:*** Long vs short duration
- ***Pitch accent:*** High vs low pitch
- ***Dynamic accent:*** Loud vs soft volume level

Often, two or more accent types coincide on a single note. For example, the fifth note of the "Satisfaction" riff is both the highest note of the riff (pitch accent) and the longest note (duration accent). As well, the fifth note begins on a metrically weak beat but sustains to incorporate the first note of the second bar (metrical position accent).

You'll find it virtually impossible to deliberately counteract or hinder the steady procession of metrical pulses that emerges as you play rhythm patterns. You do not have to think about whether or not you've played enough beats with the correct accents to create uniform measures. Your brain automatically and correctly adds up the fractional and multiple beat durations and rest durations of the notes of your rhythm patterns and forges them into neat, uniform measures. Your playing and singing communicate those measures to your audience, *without any conscious effort on your part.*

That's why, when you play a song, you don't need to make an effort to play every beat of every measure. In fact, if you were to do that, your listeners would pelt you with cooked cabbages. Or, worse, Brussels sprouts. Because, if you were to merely

play every beat, your playing would sound exactly like a metronome—unforgivably boring.

Instead, you play and sing a variety of *irregular* rhythm patterns. Your listeners' brains automatically perceive that the individual long and short notes that make up the irregular patterns are actually simple multiples or fractions of a *regular* underlying beat. They tap their toes to the underlying beat while enjoying (you hope) the *contrasting* metrical irregularity of the phrases you sing. The very difference between the regularity of the beat and the irregularity of your rhythmic phrasing is what makes the music you play and sing rhythmically interesting. The closer your rhythm patterns match the meter, the more boring your audience finds them.

Before you know it, your irregular rhythm patterns have neatly and automatically grouped themselves into four successive measures, each with *exactly* the same number of beats (usually four, sometimes three), grouped into regular pulses.

You continue with another four measures. Now you've played eight measures, each with exactly the same number of pulses—even though you aren't paying the slightest attention to pulses and measures. Certainly not counting them.

Moreover, it doesn't matter whether you're playing a single instrument all by yourself in a little room, or you're playing in a band with a drummer, bass player, and rhythm guitar player. Even the craziest, most complicated rhythm patterns of vocalists and solo players automatically conform to the metrical structure, the steady underlying beat. You simply cannot stop yourself from *communicating* the beat, pulse, and meter unless you make a conscious effort to do so. That's the power of the Law of Simple Multiples or Fractions of the Underlying Beat.

Since you don't have to think about beat, pulse, and meter, you have amazing freedom to get as creative with *melodic rhythm* as you see fit.

7.8.4 UNDERSTANDING OSTINATO, YOUR CLOSE PERSONAL FRIEND

A few pages ago, you learned a specific definition of a rhythm pattern: "an irregular succession of tones." An ostinato is a rhythm pattern that has several important properties:

- ***It's short.*** An ostinato usually lasts only a bar or two. Often only a fraction of a bar.

- ***It repeats.*** Ostinato is Italian for "obstinate" or "stubborn." An ostinato is an irregular rhythm pattern that stubbornly recurs, many times in succession

(unlike other rhythm patterns in a song). Sometimes an ostinato persists for the full duration of the song.

- ***It can be purely rhythmic, or rhythmic and melodic, or rhythmic and harmonic.*** For example, Keith Richards' "Satisfaction" riff is an ostinato that is both melodic and rhythmic. However, if you *clap* the 10-note pattern of the "Satisfaction"guitar riff (and repeat the pattern continuously), your clapping constitutes a purely rhythmic ostinato. An ostinato can also take the form of a repeated sequence of chords, such as the famous "Blue Moon" progression: I – VIm – IIm – V7.

A song can have several ostinatos going on at the same time—for example, a Latin percussion pattern, a distinctive bass rhythm pattern, and a three-note trumpet figure repeating every two bars.

Listen to any great recording of a popular song and you'll usually be able to pick out several ostinatos, instrumental and vocal. Some appear only in verses, some only in choruses, some only in the middle eight, and some throughout the song. For examples of vocal ostinatos, have a listen to "laundry list" songs, such as John Lennon's "God" or Bob Dylan's "A Hard Rain's A-gonna Fall."

Ostinatos that continue for the duration of a song are sometimes called "grooves." Some ostinatos, associated with specific performers, genres, sub-genres, or styles of dance, have names such as:

- Boogie woogie
- Bo Diddley beat
- Memphis beat
- Jazz waltz
- Louie Louie beat
- Tango
- Bolero
- Polka
- Samba
- Bossa Nova

But most ostinatos do not have names. They're just short vocal or instrumental patterns that repeat successively:

- Background singers repeating "baybah, baybah" throughout a verse or chorus
- Travis-style guitar finger-picking accompanying a folk or country vocal
- The drum part in Ravel's "Bolero" (a spectacular ostinato)

Think of the ostinato as the lowest form of *rhythm*, as opposed to meter. ***Ostinatos serve a vital purpose: they provide structure to a song.***

7.8.5 SUPERIMPOSED OSTINATOS IN HIP-HOP AND DANCE/ELECTRONICA

If you aspire to be a hip-hop or dance music producer, you need to become a master of ostinato, the rhythmic mainstay of beatmakers. Hip-hop and dance tracks usually contain multiple ostinatos, superimposed in accordance with the good ol' Law of Simple Multiples or Fractions of the Underlying Beat. Some of the ostinatos change from section to section, some remain throughout the track.

In Figure 131 below, for example, A, B, C, and D represent completely different superimposed ostinatos (i.e., each is an *irregular* rhythm pattern, not just a pulse) in various percussion, synth, and bass parts.

FIGURE 131 Superimposed Ostinatos

<table>
<tr><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td><td>A...</td></tr>
<tr><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td><td colspan="2">B ......</td></tr>
<tr><td colspan="4">C ....</td><td colspan="4">C ....</td><td colspan="4">C ....</td><td colspan="4">C ....</td></tr>
<tr><td colspan="8">D ....</td><td colspan="8">D ....</td></tr>
</table>

In dance music, the meter is simple quadruple. But in hip-hop, as discussed in Section 7.6.3, the meter is often combined. Each "underlying beat" is a skpple pulse, and therefore has built-in swing. That's why hip-hop beatmakers have to be careful to keep superimposed ostinatos irregular but *simple.* Otherwise, the overall rhythm could become cluttered and confusing—not inviting of entrainment.

Table 62 below shows how the ostinato fits into the larger structural picture.

TABLE 62 Metrical and Rhythmic Elements and Their Properties

		Type of Pattern	Accented Beats?	Duration of Pattern	Type of Repetition
Metrical Elements	**Beat**	Regular	No	1 beat	Continuous
	Pulse	Regular	Yes	2 or 3 beats	Continuous
	Meter	Regular	Yes	1 bar	Continuous
Rhythmic Elements	**Ostinato**	Irregular	Yes	A few notes contained within 1 or 2 bars, sometimes 4	Continuous
	Vocal or Melodic Phrase	Irregular	Yes	From a few notes to a dozen or so	Usually returning; sometimes continuous

7.8.6
KEEP YOUR BASS PLAYER AND FIRE YOUR DRUMMER (IF YOU *HAVE* TO CHOOSE)

Drums and bass both communicate meter, while adding rhythmic interest (usually via ostinato).

Q: If you're lost in Jaurez in the rain and you have to fire either your drummer or your bassist to remain financially solvent, which player would it be wiser to axe?

A: The drummer. (Or, like Sarah McLachlan, just marry him.)

The White Stripes notwithstanding, bass is not only a mainstay of meter, it also contributes hugely to tonality and harmony by stepping through the important notes—chord roots, thirds, and fifths.

Although melody forms the skyline and gets the glory, bass provides the foundation of the overall sound.

DRUMMER DAISUKE INOUE, INVENTOR OF KARAOKE

Next time you're having a few at the Wrong Ranch Saloon on karaoke night and decide to stagger up to the stage to see if you can make the crowd forget Sadie and Ellie Sue's eccentric duet rendition of "Love will Tear Us Apart," spare a thought for the man who made it all possible. That good-natured Japanese sometime drummer, Daisuke Inoue.

Born in Osaka in 1940, Inoue played drums badly in cover bands in the 1960s for businessmen who liked to sing songs with live accompaniment. in 1970, at the request of a client, he made a tape of his band playing songs without vocals and packaged it with a microphone and amplifier: the first karaoke machine. (Karaoke literally means "empty orchestra.") The idea caught on, and he and his friends made a bunch of the machines and leased them to bars around town.

Alas, Inoue neglected to patent his invention, which soon became all the rage in Asia, and in time swept the world. Today, karaoke is a multi-billion-dollar industry.

For his efforts, Inoue received the Ig Nobel peace prize in 2004, an incredible honour for a drummer.

7.8.7 EMOTIONAL EFFECTS OF VARIOUS KINDS OF RHYTHM AND ARTICULATION

Table 63 below lists some reported emotional effects of rhythm in the broad sense of the word: "the aspect of music that has to do with the distribution of beats and pulses through time," which includes meter.

TABLE 63 Emotional Effects of Rhythm and Articulation

Perceived Quality	Associated Emotions
Legato (smooth, no pauses between notes)	Happiness, dignity, peace, majesty, solemnity, melancholy, longing, sadness, tenderness
Fluent, flowing	Dreaminess, serenity, sentimentality, grace, sparkle, happiness
Lilting	Tenderness
Gentle	Sadness
Lively, skipping	Happiness
Jerky	Fear
Sudden changes in rhythm	Anger
Complex	Anger
Rough	Uneasiness; amusement
Sharp contrasts in note duration	Happiness
Staccato (played notes alternating with short rests)	Agitation, energy, intensity, activity, anger, fear, happiness
Firm	Dignity, solemnity, vigour, majesty

7.9
Meter and Rhythm in Popular vs "Classical" Music

> *Parsifal* is the kind of opera that starts at six o'clock. After it has been going for three hours, you look at your watch and it says 6:20.
>
> —DAVID RANDOLPH

7.9.1
ONE BIG DIFFERENCE: BIG BEAT

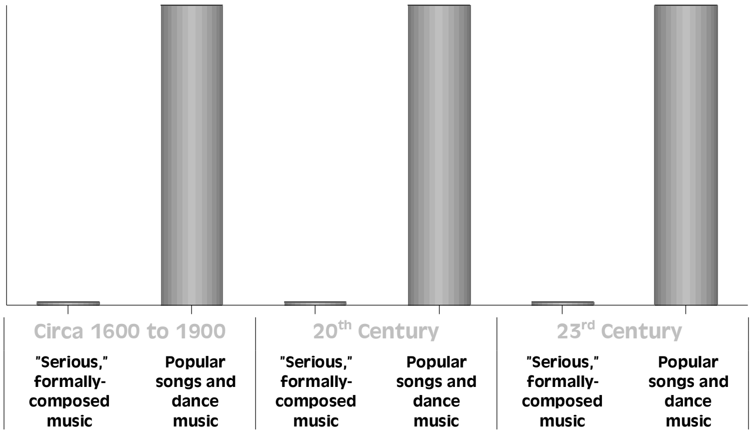
Many people think that, in the days of Bach and Beethoven and Mozart, most people listened to the music of Bach and Beethoven and Mozart. Not true. The mass of people never heard of 'em. The masses did not live in cities and did not attend concerts of so-called "serious" music. They lived on farms and in small villages. They played and sang their own folk songs, and danced to their own home-made music.

> ***Unlike "classical" music, most popular and indigenous music was, and still is, comprised of words set to music. Humans prefer music* with lyrics.**

Also, as discussed in Chapter 2, most "classical" music, in addition to being purely instrumental, emphasizes melody and harmony and *de-emphasizes beat, pulse, and meter.* Beat-impoverished music does not invite entrainment. A symphony orchestra may have 50 or 60 or 70 players, but only one is a percussionist (sometimes two), and the percussionist does not even play throughout a typical symphonic piece.

No wonder, then, that if you were to chart the relative popularity of "serious," formally-composed music against "popular" music over centuries gone by and even into the future, the comparisons would probably look something like Figure 132:

FIGURE 132 Relative Popularity of "Serious" vs "Popular" Music (An Approximation)



THE REALLY TERRIBLE ORCHESTRA

If you cannot play a musical instrument well ... take heart! There's a special place for the likes of you.

Yes, it's The Really Terrible Orchestra, affectionately known as the RTO. They even have a CD on the market. Curiously, it's hard to find. RTO concerts always sell out for the same reason Florence Foster Jenkins' recitals always sold out.

For more information on the RTO, gallop on over to their modest website:

www.TheReallyTerribleOrchestra.com

7.9.2 OTHER BIG DIFFERENCES: IMPROVISATION, SYNCOPATION, AND POLYRHYTHM

> In fifteen seconds, the difference between composition and improvisation is that in composition, you have all the time you want to decide what you want to say in fifteen seconds, while in improvisation, you have fifteen seconds.
>
> —STEVE LACY defining improvisation in 15 seconds

As discussed in Chapter 2 in the section on jazz, improvisation all but disappeared from European and North American classical and popular music until, in the early 20th Century, jazz came along and resurrected it. Why did it nearly vanish in the first place?

In his book on improvisation, Derek Bailey offers this explanation:

> The petrifying effect of European classical music on those things it touches—jazz, many folk musics, and all popular musics have suffered grievously in their contact with it—made the prospect of finding improvisation there pretty remote. Formal, precious, self-absorbed, pompous, harbouring rigid conventions and carefully preserved hierarchical distinctions; obsessed with its geniuses and timeless masterpieces, shunning the accidental and the unexpected: the world of classical music provides an unlikely setting for improvisation.

He then goes on to note that in *early* European classical music, improvisation actually did play a major role. But over time, with the ascent of the conductor as the "chief of police" of the orchestra, improvisation in classical music declined rapidly until it disappeared altogether.

Improvisation almost always implies *syncopation* in melodic rhythm: accenting beats that normally don't get accented, foiling the brain's prediction machinery and heightening rhythmic interest. While syncopation is most radical in jazz, syncopated rhythms are also found in most good popular songs.

A simple example: the fifth note of the "Satisfaction" riff is rhythmically important because it's the longest note (duration accent) and highest-pitched note of the riff (pitch accent). But it falls on the metrically weak position between the fourth beat of the first bar and first beat of the second bar. This results in *rhythmic dissonance*, or syncopation. The fifth note is more interesting and gets more attention than it would have gotten had it fallen predictably on the metrically-strong first beat of the second bar, a half-beat later.

Cross Rhythm

A common way of creating syncopated rhythmic interest is to use a type of ostinato called *cross rhythm.* In cross rhythm, the strong accents of the rhythm pattern fall on weak accents (or between accents) of the meter, resulting in a pronounced syncopated effect. The rhythmic cycles of each instrument or voice synchronize at the beginning of every bar or every other bar. Here's an example:

Metrical Accents	● • ● •	● • ● •
Cross Rhythm Accents	● • • ● • • ● ●	● • • ● • • ● ●
Counted Beats	1 2 3 4	1 2 3 4

7.9.3 POLYRHYTHM: BREAKING THE LAW OF SIMPLE MULTIPLES OR FRACTIONS OF THE UNDERLYING BEAT

"Polybeat" or "polypulse" would be more appropriate terms for what's usually called *polyrhythm*.
Try this.

1. Get your right foot tapping at a steady moderate tempo.

2. As you tap your foot, count 1-2-1-2. Continue for several bars.

3. Start tapping your right thigh with your right hand in unison with your right foot, still counting. Continue for several measures. It's dead easy with foot and hand tapping in regular steady sync. Like this:

Right Foot	1	2	1	2	1	2	1	2
Right Hand	1	2	1	2	1	2	1	2

4. Now, with your right hand, tap *three times* (counting aloud) in the same time interval that your right foot taps *twice,* every second measure. Note that the 3-hand-tap durations are *equal* and distributed over *two* foot-taps, not one. So it's not as easy as it seems. The hand-taps are a little faster than the foot taps, but not a lot faster.

Right Foot	1	2		1	2		1	2		1	2	
Right Hand	1	2		1	2	3	1	2		1	2	3

5. Finally, try this:

Right Foot	1	2		1	2		1	2		1	2	
Right Hand	1	2	3	1	2	3	1	2	3	1	2	3

You may find it easier if you don't have to do both parts yourself. For instance, you could get a metronome to do the 1-2-1-2 part, while you tap the 1-2-3-1-2-3 part.

You can hear examples of #4 and #5 above on The Doors' original seven-minute recording of "Light My Fire," beginning at around the 5:15 mark, near the end of the long instrumental bridge.

The left hemisphere of your brain, which controls your right foot and right hand, is dominant for temporal sequencing. So, if you're right-handed, you will probably find it more difficult to do the above experiment with your left foot and left hand, especially as the tempo increases. (Try it!)

In general, contrasting duple and triple pulses played simultaneously result in polyrhythm. Between bar lines, the pulse accents conflict. Every measure or two, the accents sync up.

Rappers commonly employ polyrhythm in their rhythmic delivery. If you can find a way to work a bit of polyrhythm into your songwriting, by all means, do it.

7.10 Meter, Tempo, and Rhythm: Unity and Variety

7.10.1 OPTIMIZING UNITY AND VARIETY IN METER, TEMPO, AND RHYTHM

In general, when the synchrony of beat, pulse, and meter get disturbed, emotional response increases with the intensity and frequency of the disturbance. Table 64

below summarizes how you can optimize unity and variety in your songwriting by making astute choices with respect to pulse, meter, tempo, and rhythm.

TABLE 64 Optimizing Unity and Variety in Meter, Tempo, and Rhythm

	Prefer...	Instead of...
Human Memory	• Keeping in mind the types, functions, and limitations of human memory—especially working memory—in all aspects of songwriting, not just meter, tempo, and rhythm	• Writing songs without regard to memory limitations
Beat and Pulse	• Distinguishing between beat and pulse (learn how to make effective use of all three pulse types)	• Considering beat and pulse as merely two terms for the same element
Meter	• Simple quadruple and simple triple meter • Combined meter—especially combined quadruple • Occasional use of compound and irregular meter	• "Default" simple quadruple meter only • No simple triple meter • No combined meter • No compound or irregular meter
Tempo	• Tempo variety: from 60 to 240 BPM or faster • Variety of *combinations* of meter types and tempo ranges ("strolling, walking, jogging, running")	• "Default" tempo only in all your original songs (approximately 110 to 140 BPM)

Rhythm	• Regular use of ostinatos • Returning phrases of 2 to 4 measures, with significant intervals between phrases • Use of cross rhythm • Occasional use of polyrhythm	• Few or no ostinatos • Long, non-returning phrases • Short rests between phrases • Little use of cross rhythm • No use of polyrhythm

7.10.2 THE WUNDT CURVE OF UNITY AND VARIETY

Your songwriting and recording will benefit greatly if you get into the habit of using the Wundt curve to evaluate unity and variety inherent in each element of your songs—harmony, meter and rhythm, form, melody, lyrics, recorded performance, musical arrangement. And the song as a whole. *Especially* the song as a whole.

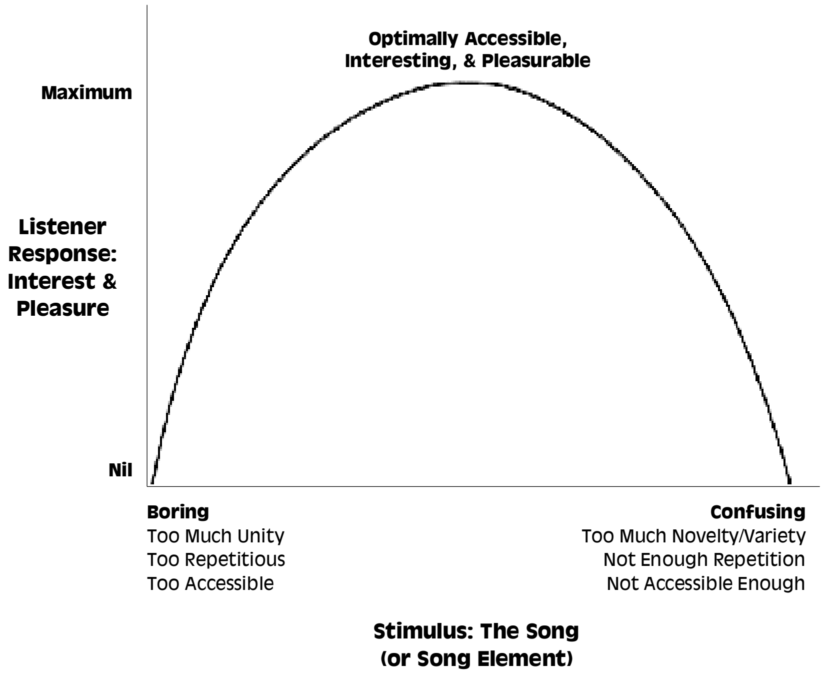
The Wundt curve (named for the German psychologist Wilhelm Wundt, widely regarded as the founder of experimental psychology) looks like an inverted "U." In a musical context, the Wundt curve shows how the relative complexity of a musical stimulus affects your listeners' perception of pleasure, their "hedonic response."

As the novelty and complexity of the song or song element (the *stimulus*) increases, listeners get more interested in what they're hearing. And they experience more pleasure (the *response*).

But only up to a point.

After that, as you continue to increase musical or lyrical novelty or complexity, hedonic response *decreases* because listeners' brains simply can't take it all in and decode it (Figure 133). Human memory does not work like silicon chip memory.

FIGURE 133 Wundt Curve of Unity and Variety



(The citizens of the city of St. Louis, Missouri, were so impressed with the Wundt curve that, in 1964, they commissioned the construction of an enormous monument to the Wundt curve—630 feet high!—and called it the "Gateway Arch" because it sounds better than "Wundt Arch." To see what it looks like, go to the official website, www.GatewayArch.com. Click on "Photographs" in the left-hand column.)

Most of the time, songs that fail (i.e., do not move audiences emotionally) have too many elements that cluster too far to the right on the Wundt curve. Too many extended chords (as opposed to simple triads and dominant sevenths). Too many melodic phrases that go on too long with too few breaks. Too many unrepeated words in the lyric. Too many instruments playing simultaneously in the performance of the song (live or recorded). Just too much going on in general. Repeat: human memory does not work like silicon chip memory.

Great songwriters have an understanding of the degree of novelty each element of a song can stand without ruining the song as a whole. Many things happen simultaneously as a song unfolds: chord changes, meter, rhythm, melody, lyrics, instrumental performance, vocal performance. So it's better to practise restraint with

respect to the individual elements. Restraint tends to work better than excess. After all, the audience hears the *combined effect* of all the elements. So if you go overboard with each of the individual elements, you end up with incomprehensible, confusing mush.

Lennon and McCartney were the supreme masters at knowing where to draw the line musically and lyrically with *each element* of each song. Most listeners perceive the combined effect of most Lennon-McCartney songs as occupying the top of the Wundt curve: maximally interesting (variety), yet maximally accessible (unity)—the observation deck at the top of the Gateway Arch. You can never go wrong studying the Lennon-McCartney catalogue.

You can turn up the novelty in one element if you tone it down in another. For example, Pink Floyd's "Money" has highly irregular meter, corresponding to a position on the right-hand side on the Wundt curve. But the arrangement of voices and instruments is such that the chunking of pulses is obvious and easy to follow, corresponding to a position on the left-hand side of the curve. So the listener finds it easy to follow the pulses and at the same time takes pleasure in the novelty of the unusual meter. Metrically, the listener experiences the top of the Wundt curve.

As you create your own songs, use the Wundt curve as a mental check at every stage. Table 64 above and related tables on optimizing unity and variety near the ends of Chapters 6 through 10 will help you make informed decisions about how far to go with each element.

Whatever you do, ignore rubbish about the need to "challenge the listener" with "challenging music" and "challenging lyrics." Songwriters who adopt this mindset end up stocking challenging shelves at Wal-Mart because nobody wants to listen to inhuman songs that communicate nothing emotionally, except irritation.

8

How Phrase and Form REALLY Work

Lord Ronald said nothing; he flung himself from the room, flung himself upon his horse and rode madly off in all directions.

—STEPHEN LEACOCK

8.1 Distinguishing Between VM (Vocal-Melodic) Phrases and Structural Phrases

8.1.1 VM (Vocal-Melodic) Phrases

As discussed in earlier chapters, music and language likely co-evolved. It's not surprising, then, that language and music resemble each other structurally.

In language, phrases group into sentences, sentences into paragraphs, paragraphs into larger units such as short stories or chapters. In written language, punctuation marks such as commas, colons, semicolons, and periods signal boundaries between word groups and clarify meaning.

But punctuation in language does not imply lengthy time lapses between word groups. When you read a phrase or clause that ends with a comma, you do not wait for several seconds before continuing to read to the end of the sentence. And when you get to the end of the sentence, you simply read the next sentence without pausing.

Similarly, when you listen to someone delivering a speech or narrating a story, you do not expect the speaker to stop speaking for several seconds at the end of every phrase, clause, and sentence. You would quickly lose patience and start throwing cabbages.

But when you set words to music (or music to words), everything changes, timewise. Words with music, unlike words without music, do not (or should not) go on continuously. Instead, pauses (rests) break up the flow of musical notes and accompanying words into *vocal-melodic phrases,* each consisting of a handful of "note-syllables"—syllables or words (or one-syllable words) sung to individual notes. An appreciable time interval separates each vocal-melodic or "VM" phrase. Depending on the tempo and other variables, intervals (rests) separating VM phrases from each other within verses or choruses last from about one second to five or six seconds.

VM phrases convey novel musical ideas. They are fundamentally rhythmic, not metrical. A VM phrase typically consists of five to 10 note-syllables in a *unique rhythm pattern*.

When you remove the words, a VM phrase becomes simply a melodic phrase played on a musical instrument, instead of sung. A melodic phrase has all of the characteristics of a VM phrase except, of course, the sung syllables. A VM phrase or melodic phrase comprised of only two or three or four notes is called a *motive* or *motif* or *figure*. A famous example is the four-note "fate motif" that opens Beethoven's *Symphony No. 5* and gets batted around like a volleyball throughout the first movement.

8.1.2
STRUCTURAL PHRASES

Suppose you play piano or guitar, but not terribly well. Only well enough to play chord changes to accompany your vocals. You can't play solos. And suppose you're playing and singing a new song for an audience of dubious sobriety at the Wrong Ranch Saloon. Suddenly you forget the words to the next verse. So you just keep playing the chord changes, maintaining a steady beat, trying to remember the words, unable to incorporate melody into your instrumental playing. And dodging Brussels sprouts for your efforts.

Without the tune, the chord changes you're playing group into *structural phrases.* A structural phrase is a *metrical* unit, not a rhythmic unit. It's a *chunk of bars*. Usually

four consecutive bars. Sometimes two bars if the tempo is slow. Eight bars if the tempo is fast.

When you remember the words again and resume singing, you resume *superimposing* your VM phrases over the structural phrases of your instrumental playing.

Here are the main properties of the two phrase types (Table 65):

TABLE 65 Phrase Types and Their Properties

	VM or Melodic Phrase	Structural Phrase
Rhythmic or metrical?	Rhythmic	Metrical
Pattern type?	Irregular	Regular
Melodic?	Yes	No
Comprised of?	A sequence of sung musical notes (or instrumentally-played notes if it's a melody with no lyric, such as the "Satisfaction" guitar riff)	A chunk of bars
Typical length?	5 to 10 "note-syllables" (or notes, if no lyrics); VM phrases are almost always *shorter* than structural phrases, seldom the same length, never longer	4 bars is standard, but can be 2 or 8 bars, depending on tempo; occasionally 3, 5, or 6 bars
Continuous or discontinuous?	Discontinuous: substantial time intervals normally separate VM phrases	Continuous: a piece of measured music is comprised of a series of structural phrases, uninterrupted from beginning to end
Metrical positioning?	VM phrases are *superimposed* on structural phrases; a VM phrase frequently straddles two structural phrases	Not applicable because structural phrases are metrical units

IMPORTANT: In Chapter 9, you will see why it's vital that you keep in mind at all times the characteristics that distinguish VM

> **phrases (and melodic phrases) from structural phrases—if you aspire to write great tunes consistently. Especially the fact that VM and melodic phrases are *rhythmic* and structural phrases are *metrical*.**

Structural phrases chunk into *periods.* A period is a pair of structural phrases with superimposed VM phrases. The VM phrases form a complete musical statement, the musical equivalent of a sentence in language.

> **The *musical period* is the structural cornerstone of great popular songwriting.**

Periods chunk into verses, choruses, and middle eights—the largest structural elements of songs.

Musical punctuation within phrases and periods takes the form of various types of cadences (discussed in Chapters 6 and 9).

The structural resemblances between music and language may explain why, in children, musical training has been shown to improve verbal memory.

8.1.3
MUSICAL STRUCTURE AND GESTALT PRINCIPLES

Your brain is always looking for patterns that make a seemingly chaotic world more comprehensible, more coherent. Experimentally-based Gestalt psychology describes how your brain seeks patterns, or "Gestalts"—structures that have greater meaning than the proverbial sums of their parts.

Several Gestalt principles apply to the understanding of song form and musical structure generally:

- ***Proximity.*** Your brain looks for meaning in groups of things that are *close together*. Musically speaking, proximity means close together in pitch and *in time*—for example, a group of notes that coheres into a meaningful musical unit. A melodic or VM phrase is a Gestalt. Each note in isolation has no meaning, but the *group* has meaning.

- ***Similarity.*** Your brain looks for meaning in groups of things that are similar. In music, *similarity means repetition*. Sometimes exact repetition, sometimes "similar" repetition—repetition with variation. Repetition of VM phrases, of structural phrases, of chord changes, of lyrics.

- ***Continuation.*** Your brain looks for meaning in patterns that continue. In song structure, for example, if melodic lines are well-constructed, your brain will

perceive the phrases as flowing, one from another. And if a verse is followed by a chorus, then another verse, then a chorus, and so on, your brain expects the alternating pattern to continue.

- ***Closure.*** Your brain looks for a pattern to come to a meaningful state of completion. Musical closure usually takes the form of a *perfect cadence*, which you learned about in Chapter 6. A *coda*, a short passage at the end of a song, is another structural element that signals closure.

Keep Gestalt principles in mind as you create and perform music. Audiences find meaning and satisfaction in *sonic pattern recognition*. It's why structured, comprehensible, tonal music attracts appreciative audiences, and unstructured, incomprehensible, atonal music does not.

8.2 Why Binary Structure Is the Soul of Great Popular Song Form

8.2.1 BINARY STRUCTURE AT EVERY LEVEL

Four bars is the default structural phrase length. But a structural phrase can be as short as two bars or as long as six bars (at medium tempo).

Eight bars is the default length of a *period*, which consists of two consecutive structural phrases. The second structural phrase contains a VM phrase that "answers" or completes the VM phrase contained in the first structural phrase.

The VM phrases contained in the two structural phrases of a period usually musically balance each other in some way: same (irregular) rhythm pattern, parallel melodic contour, parallel lyrics, same sequence of chord changes, or some combination. This is referred to as *binary structure, binary form,* or *question-answer structure*.

You'll find binary form everywhere as structural scaffolding in popular music (and in classical music):

- ***Pulse.*** Two beats chunk into a duple pulse.

- ***Bar.*** Two duple pulses chunk into one bar. That's enough metrical space to hold the germ of meaningful melody such as a motive or a short ostinato.

- ***Structural phrase.*** Two *pairs* of bars form a four-bar structural phrase, by far the most common phrase length. Why do *four bars*—two pairs of bars—constitute the standard structural phrase length, instead of two bars? For the same reason *four beats* constitute the standard number of beats to the bar: chunking. Four beats chunk into two duple pulses. Similarly:

    - A structural phrase of four bars works metrically like a single long, scaled-up "super-bar," the constituent bars of which chunk into duples.

    - Bar one is metrically more emphatic than bar two. So the first two bars of a structural phrase chunk into a duple unit, like the first two beats of a bar.

    - Bar three is metrically more emphatic than bar four. So the third and fourth bars of a structural phrase chunk into a duple unit, like the third and fourth beats of a bar.

    - This is why a short VM phrase contained within the first two bars of a four-bar structural phrase is often repeated in bars three and four in the same rhythm pattern, with the same tune.

  In language, a long spoken phrase or clause of nine or ten syllables usually has three or four accented syllables. An average VM phrase contained in (or, if you prefer, superimposed on) a structural phrase has a similar number of metrically accented and unaccented notes. (Ordinary conversation is the language equivalent of a jam session in music.)

- ***Period.*** Two four-bar structural phrases form a period, containing VM phrases that form a complete, meaningful "question-answer" unit, which sometimes stands as a complete verse or chorus or middle eight.

- ***Verse or chorus.*** Two periods form a major 16-bar section of a popular song. Like pairs of beats in a bar and pairs of bars in a structural phrase, pairs of periods chunk into a verse or chorus.

The above assumes a moderate tempo. At a fast tempo, you'd double most of the above numbers.

8.2.2 CHUNKING AND "REPETITION OF REPETITION OF REPETITION": COPING WITH THE LIMITS OF SHORT-TERM/WORKING MEMORY

When the music's fast, more bars go by per unit of time than at medium tempo. So at a fast tempo, you can safely increase the absolute number of notes in a VM phrase without overtaxing the duration capacity of short-term memory. But short-term memory is still always limited in the number of *items* it can hold, regardless of elapsed time.

Amateur songwriters often write long, 30-note or even longer VM phrases at moderate tempo with little internal repetition. Unless the tempo is fast and repetition deft and copious, that many sung notes without a break overloads short-term memory.

It's no accident that binary structure is found throughout the overwhelming majority of successful popular songs. Binary structure is all about chunking and repetition. Repetition of repetition. Repetition of repetition of repetition. Repetition of repetition of repetition of repetition. Repetition of repetition of repetition of repetition of repetition.

Binary structure is all about overcoming the limits of short-term memory. For instance:

- Suppose you start with a short VM phrase of, say seven notes, contained within two bars.

- You let the next two bars go by without introducing any more vocal material, to let the VM phrase sink in. Now you have a seven-note VM phrase contained within the first two bars of a four-bar structural phrase.

- You repeat the original VM phrase with a slight variation, followed by two bars of rest (first instance of vocal repetition). This completes an eight-bar period: two structural phrases, chunked.

- You repeat all eight bars exactly (repetition of repetition). Now you've got 16 bars. Still, you've only introduced a single VM phrase of seven notes (albeit with minor variation). Listeners have already heard the melody four times, and you've just started.

- If it's a verse, that same short melody, with different but *related* lyrics, will repeat another 8 or 12 or 16 times (repetition of repetition of repetition ...),

alternating with choruses or other structural elements, before the song is over in three or four minutes.

The chorus usually introduces a new melodic idea, but still uses *binary* structure—a period, or two periods—to repeat new melodic material as much as possible. Same with the structure of the middle eight (normally one period), which provides relief from potential boredom, but without abandoning the principle of repetition.

By the end of the song, the amount of *unique* melody is in the range of only 8 to 15 seconds, but the song has gone on for 200 to 240 seconds. Roughly 5% unique melody, 95% repetition and melodic rest.

8.2.3 TECHNIQUES OF VARIATION WITHIN BINARY STRUCTURE

Go to the *Gold Standard Song List*, find some tunes you know, and go over them in your mind, listening for binary structural phrasing and binary vocal phrasing at every level, even the sub-phrase level.

Note especially how the *period* pervades great songs. And note the methods great songwriters use to introduce variety within inherently repetitive binary structure. Here are some of the techniques you'll find:

- A short melodic theme is introduced, then repeated exactly, but with a change in the accompanying chord progression.

- A short melodic theme (three to five notes) is introduced with an ear-catching syncopated rhythm pattern, followed by exact repetition of the same rhythm pattern but with a contrasting melody.

- An extension of one or two bars is tacked on to a four-bar structural phrase to provide relief from a longish VM phrase, forming a structural phrase of five or six bars. Repeated, with variation, to form a 10-bar or 12-bar period.

- An extension of one or two bars is added to the end of an eight-bar period to let the melody sink in, forming a 10-bar period.

  NOTE: It's common in great songwriting to create periods that vary from the conventional "four bars plus four bars." For example:

- First structural phrase, five bars; second structural phrase five bars
- First structural phrase, six bars; second structural phrase four bars
- First structural phrase, four bars; second structural phrase three bars
- First structural phrase, four bars; second structural phrase six bars

And any number of other combinations. Usually, when a structural phrase is longer than four bars, the extra bar (or bars) adds needed space between VM phrases. When shorter than four bars, a bar is removed to avoid leaving too much space between VM phrases.

When a period is lengthened or shortened in this way, the unusual period length creates interest (variety) because it foils the brain's prediction machinery, which expects eight-bar periods. The unconventional period is usually repeated to ensure that unity is not compromised.

- An eight-bar period is followed by a four-bar structural phrase with no melody, creating a 12-bar unit (e.g., a verse or chorus).

- A VM phrase that goes on for four bars is followed by four bars of melodic rest, followed by repetition of all eight bars with a variation in the melody (but not the *rhythm* of the melody) and/or accompanying chord progression.

- A VM phrase contained within two bars is repeated immediately with a slight variation, followed by repetition of the first two bars, then repetition of the third bar (i.e., the first bar of the variation), creating a *seven-bar* period.

- A VM phrase within a four-bar structural phrase is followed by a completely different VM phrase within the next four-bar structural phrase; all eight bars are repeated with slight variation to complete a 16-bar period. (This is more common with fast-tempo songs because the clock time of 16 bars is reasonably short, so short-term memory can handle it.)

- An eight-bar period is followed immediately by a contrasting eight-bar period (i.e., different VM phrases within each period). The two periods form a verse, which is repeated throughout the song without a chorus or middle eight, but with instrumental solos between the verses.

- Two eight-bar periods are followed by a stand-alone four-bar structural phrase containing a contrasting VM phrase (20-bar unit).

- An eight-bar period is followed by a four-bar structural phrase containing a VM phrase with a similar or identical rhythm pattern but contrasting melody (standard 12-bar blues).

- A four-bar phrase is repeated with variation, then repeated again with variation, forming a 12-bar period.

8.2.4 CHUNKING AND STRUCTURAL UNIT SIZE

Only your imagination limits the number of ways you can manipulate structural pairs, and pairs of pairs, for the sake of variety. There's a good reason why so much variety is possible at the level of the phrase and period:

Chunking weakens as structural units get larger.

So variations at "macro" structural levels do not disrupt unity and coherence, as happens with variations at "micro" levels.

- At the "micro" level of beat and pulse, with the shortest time intervals between rhythmic events, the effect of chunking—binary and triple—is at its most powerful. So strong that beat and pulse continue with entirely predictable, clockwork regularity throughout the song.

- At the level of the bar, with a longer time span, both binary and triple chunking are still pretty strong. But it's possible to abandon a song's initial meter and switch to a different meter without confusing the listener. It's not that uncommon for meter to change within a song, for example, from 4/4 to 3/4 and back again. In Roger Waters' "Money," the meter changes from 7/4 to 4/4 *twice*.

- At the level of the phrase, chunking in groups of three all but vanishes. However, binary chunking remains intact. Songs written in triple pulse or triple meter—waltz time— usually have a *binary* structure at the phrase level (two duple bars) and higher (two-phrase periods, two-period verses).

- At the level of the song as a whole, binary chunking finally loses its grip. Your brain does not expect patterns of two consecutive verses to be followed by two consecutive choruses. However, Gestalt principles continue to apply. Listeners still want to recognize patterns.

To summarize, when working on a song and thinking about structure, keep in mind these principles:

1. ***Think of the* period *as the most useful structural unit—not the verse or chorus.*** Think question-answer. Within phrases. Within periods. Think pairs. Pairs of pairs. Repetition of repetition. It's worth repeating that in music, the *period* is the equivalent of the sentence in language. It's the standard unit of meaningful communication, a product, ultimately of Darwinian natural selection. A musical period, like a sentence, is short enough to be captured in short-term memory as a complete, coherent, expressive unit, yet long enough to permit limitless variety.

2. ***Vary the way you construct your periods internally***, or you will bore your audience. The list in the preceding section provides a few examples of how to do this. The best way to master musical periods is to listen to successful songs, such as those on the *Gold Standard Song List*, especially the older ones that have stood the test of time. Note how great songwriters vary the second halves of periods melodically and harmonically, without losing unity. And how they often increase or reduce a standard four-bar structural phrase by a bar or two, creating seven-bar, nine-bar, or ten-bar periods.

3. ***Remember the Wundt curve.*** For instance, if you write a song in which all the phrases are exactly four bars long (left side of the Wundt curve), you will probably want to vary the vocal phrasing in the second halves of your periods quite a bit to offset the potentially monotonous squareness of consecutive four-bar structural phrases. If your structural phrases are of an unusual length, such as three or five or six bars (right side of the Wundt curve), then you may need to reduce or eliminate variation in vocal phrasing (left side of the curve).

4. ***Provide plenty of internal rest.*** If you fill an entire four-bar structural phrase with dense vocal melody, follow up with two or four bars of melodic rest. In general, leave significant intervals between bursts of melody *within* periods, not just between verses and choruses.

8.2.5
RELATIONSHIPS BETWEEN VM PHRASE BEGINNINGS AND STRUCTURAL PHRASE BEGINNINGS

A VM phrase can begin near the end of one structural phrase and carry over into the next structural phrase. This happens commonly. "Happy birthday to you," for instance, is a VM phrase that begins at the end of one structural phrase (the word "Happy") and carries over to the next structural phrase ("birthday to you").

But there's no such thing as a VM phrase crossing *two* structural phrase boundaries. In the mind of the listener, a structural phrase extends to contain a continuing VM phrase until the VM phrase ends. Then the structural phrase normally continues on to complete a structural unit of an even number of bars. For example, if a VM phrase extends through five bars, it will usually be followed by either:

- One bar of melodic rest, for a structural phrase length of six bars; or
- More commonly, three bars of melodic rest, for a structural phrase length of eight bars. Then, most likely, the entire eight bars will repeat, with the first five bars containing the melody of the same VM phrase (or a minor variation) with different lyrics.

A VM phrase can begin in any of three positions with respect to the beginning of a structural phrase:

- ***Before*** beat one of bar one of a structural phrase (the default, called *anacrusis*)
- ***On*** beat one of bar one of a structural phrase
- ***After*** beat one of bar one of a structural phrase

1. Beginning the VM phrase *Before* Beat One of Bar One (Anacrusis, the Default)

This is the safest, most common way (the default method) of starting the first VM phrase of a tune. The ear expects to hear the first "important" note of the tune on beat one of bar one of the structural phrase—the metrically strongest position of the phrase. Having one or two metrically weak anticipatory notes before beat one of bar one telegraphs the "real" start of the tune—"Happy Birthday," for example.

An example of a song that uses this telegraphing technique in an unusual way is "Early Morning Rain," by Gordon Lightfoot, a classic covered by Elvis Presley, Bob Dylan, Count Basie, The Grateful Dead, Tony Rice, and many others.

The tempo of this song is fast, about 220 BPM, which is why the verse consists of four eight-bar periods instead of the usual two eight-bar periods. Each VM phrase begins in the last bar and a half of the *previous* structural phrase, and ends on beat one of bar one of the following structural phrase (Figure 134).

In "Early Morning Rain," the VM phrases begin *way* before beat one of bar one of subsequent structural phrases—six-note anacruses. This catches the listener's attention because it's unexpected. The pattern repeats so soon and so often that it's clearly not an anomaly, and therefore not confusing.

FIGURE 134 "Early Morning Rain": Six-note Anacruses

			In the	*ear- ly morn- in'*
Struc Phrase 1	*rain*		*with a*	*dol- lar in my*
Struc Phrase 2	*hand*		*with an*	*ach- in' in my*
Struc Phrase 3	*heart*		*and my*	*pock- ets full of*
Struc Phrase 4	*sand*		*I'm a*	*long way from*
Struc Phrase 5	*home*		*and I*	*miss my loved ones*
Struc Phrase 6	*so*		*in the*	*ear- ly morn- in'*
Struc Phrase 7	*rain*		*with*	*no place to*
Struc Phrase 8	*go*			

Here is a summary of the main structural characteristics of "Early Morning Rain":

- VM phrases begin way before—a bar and a half before—crossing the border to the next bar.
- The eight four-bar phrases are chunked into four two-bar periods.
- The *last* note of each VM phrase gets a huge metrical position accent: it lands on the *first* beat of the *first* bar of each structural phrase, after six anticipatory notes.
- Each of the eight VM phrases begins and ends in the same metrical position.
- A couple of characteristics create variety: each VM phrase is wildly offset from four-bar-squareness, and the melody is altered in six of the VM phrases. The rhythmic pattern of each VM phrase is repeated exactly in all eight phrases, which provides unity. Net effect: top of the Wundt curve.
- Each VM phrase contains only seven notes/syllables. Although the last note of every second melodic line is held, the net effect on the listener is that the interval between each VM phrase is slightly longer than the VM phrase itself. Lots of "breathing space."

Is it possible that the structure of "Early Morning Rain" could be represented accurately like this?

Struc Phrase 1	*In the*	*ear- ly morn- ing*	*rain*	
Struc Phrase 2	*with a*	*dol- lar in my*	*hand*	

The answer is no. The chord progression, cadences, and metrical emphases of final VM phrase notes—the way your brain actually interprets the meter and rhythm—clearly point to the unusual offset positioning of VM phrases with respect to structural phrases shown in Figure 134 above.

Have a listen to Lightfoot's original recording of this tune at a music download website such as iTunes. Because of the song's fast tempo, even the 30-second free excerpt will give you a clear understanding of how it works structurally.

Other songs that use the same long-anacrusis technique are the Gershwin standard, "They Can't Take That Away From Me" and Stevie Wonder's "Superstition."

2. Beginning the VM phrase *On* Beat One of Bar One

When tone one of a VM phrase coincides with beat one of bar one of a structural phrase, the VM phrase gets off to a strong rhythmic start—stronger than starting before beat one of bar one. No anticipatory notes. So the listener is less certain which note the VM phrase will start on.

3. Beginning the VM phrase *After* Beat One of Bar One

The listener expects the first significant note of the first VM phrase to begin on beat one of bar one of the structural phrase, usually with one or two anticipatory notes that telegraph the "real" start of the tune.

But what if the tune does not come in on beat one, bar one, as expected?

The melody can then only begin on a metrically weaker beat. So, starting a VM phrase *after* the first beat of the first bar of a four-bar structural phrase creates both surprise and a *syncopated effect.*

This technique is practically a trademark for some songwriters—a signature songwriting technique. Neil Young is an example. Here are a few of Young's classics in which VM phrases start *after* beat one of bar one of structural phrases:

"Cowgirl In The Sand"	"My My, Hey Hey"
"Don't Be Denied"	"The Needle And The Damage Done"
"From Hank To Hendrix"	"Ohio"
"Harvest Moon"	"Old Man"
"Heart Of Gold"	"Southern Man"
"Helpless"	"Tell Me Why"

For the sake of syncopation, jazz singers from Billie Holiday to Frank Sinatra to Diana Krall have made it a practice to start VM phrases after beat one of bar one of structural phrases. Consider how a vocalist might handle the Gershwin jazz standard, "Let's Call The Whole Thing Off." Download a recording and have a listen.

- The pulse is skipple, typical of jazz.
- Each structural unit is an eight-bar period—a pair of four-bar phrases.
- In the example below, the first structural phrase contains a binary VM phrase.
- In the second structural phrase, you'll find binary vocal phrasing from one bar to the next, and even within single bars.

VM phrases begin *on* beat one of bar one of each structural phrase and sub-phrase. Here's a typical period:

You say laughter and	*I say larfter*	*You say after, and*	*I say arfter*
Laughter, larfter	*after, arfter*	*Let's call the whole thing off*	

Now, suppose you're a singer interested in creating a syncopated effect. Instead of starting your VM phrase *on* the first beat of the structural phrase, you would hold off for a beat or two or three (begin *after*), and cram the first few notes of the VM phrase into the last two beats of bar one of the structural phrase. Something like this:

You say laughter and	*I say larfter*

Or even the last beat and a half. Or even the last beat! Or somewhere in between.

This is called *delayed phrasing* or *singing behind the beat*. You probably wouldn't want to do this on every bar, or it could start sounding pretty silly. (Although, considering Ira Gershwin's wonderfully silly lyric, that would be entirely appropriate with this song.)

Jazz vocalists also like to rush the beat or sing around the beat—anything but *on* the beat—to create syncopated melodic rhythm.

8.2.6
METRICAL POSITION VS PITCH IN MELODY AND SPEECH: THE ACCENT-MATCHING LAW

As discussed in Chapter 7, a melodic phrase is a group of *irregularly*-sequenced tones. It is rhythmic in nature, as well as melodic. Although it is not a metrical unit, a melodic phrase nevertheless is leashed to the meter. So setting words to a melody requires an understanding of the difference between accent in spoken word and accent in vocal measured music.

First, consider the way you stress syllables when you speak. When you pronounce words with two or more syllables, you stress one of the syllables (or more than one if the word has four or more syllables). In speech, stressed syllables are *higher in pitch*, not louder. Something like this, if *spoken*:

Some-
o- rain-
where ver bow
the

All multi-syllable words, and single-syllable words spoken consecutively, have melodic stress patterns like these. Therefore, every sentence we speak throughout our entire lives is actually a *melody*, as sequence of (mostly) discrete pitches.

If you're learning a new language and you're not certain where the stresses are supposed to go, you tend to use the stress patterns of your native tongue. So, if you were not fluent in English, you might say something like this:

where
ver bow
Some- o- rain-
the

This is not English with a standard accent. More like English with a French accent. Or, because of the upward inflections on normally *un*accented syllables, it could be a question. Or the sound of an adolescent "up-talker."

Harold Arlen wrote a tune to E. Y. Harburg's famous lyric. The musical intervals of the melody defy the natural pitches of the English language everywhere except on the word "over." And yet, when you hear the sung lyrics, they sound as natural as if they had been spoken.

Here's how the VM phrase begins to unfold over two bars of the structural phrase (in some recordings, the phrase begins on the second beat of the first bar):

Metrical Accents	● • ● •	● • ● •
Words and pitches	*where* *some -*	*bow* *o- rain -* *the* *ver*

Why do the sung lyrics sound natural, even though the words "somewhere" and "rainbow" have the wrong pitch accents?

Because, in vocal music—*unlike* in speech:

Metrical position accent trumps pitch accent.

The metrical position accent of beat one of bar one of the structural phrase is so powerful that, even though "where" is a full octave higher in pitch (pitch accent), and falls on an accented beat (a metrical accent, but not as strong as the metrical accent of beat one, bar one), the pitch accent of "where" does not outweigh the metrical accent of the first beat, which also has the duration accent of the sung word "some" (held for two beats).

So the word "somewhere" still sounds natural, with the accent on the first syllable, even though "where" is an octave higher in pitch. The metrical position accent of "some" trumps the pitch accent of "where."

Exactly the same thing happens with the word "rainbow." The metrical position accent of "rain" in the sung version prevails in emphasis over the higher pitch of "bow." So the sung word "rainbow" sounds as though the accent is on the first syllable, its normal position when spoken.

By contrast, consider "somewhere" in the song "Beyond the Sea." The emphasis is on the "wrong" syllable: "where" gets the strong metrical position accent. This attracts the ear's attention precisely because it's unusual and unexpected. As the old joke goes, it amounts to

pha- la-
on the wrong
em- sis syl- ble

As you'll see in Chapter 10, it's okay to do this once in a while, but lyricists who don't know much about matching the pitch accents of speech with the metrical

accents of music do this all the time. The result: entire verses and choruses that sound downright dumb and amateurish.

Put simply, here's the **"Accent-matching Law":**

> For song lyrics to sound "natural," the normal pitch accents of spoken words *do not* need to match the pitch accents of the melody. Instead, they need to match the *metrical position* accents of pulses and measures.

This is not a hard-and-fast rule, of course. But when you break it, make sure you know what you're doing. Otherwise, people will point and laugh, and you will cry as you get on your horse and ride off into the sunset.

8.3 Other Matters of Phrase and Form

8.3.1 VM PHRASE LIMITATIONS THAT DO NOT APPLY TO INSTRUMENTALLY-PLAYED MELODIC PHRASES

This chapter has focussed on VM phrases, as opposed to instrumentally-played melody, because most of the world's popular music takes the form of songs with lyrics. Since VM phrases are sung, you need to keep in mind some considerations that do not apply to instrumentally-played melody:

- ***Listeners need time to process the semantic content of lyrics.*** Listeners' brains are already absorbed processing all the musical variables. When you add words to the music, you require listeners to deal with semantic content as well. It's not difficult for the human brain to process the meaning of sung lyrics with instrumental accompaniment. Listeners obviously enjoy doing such processing, and certainly prefer songs with words over purely instrumental music. However, working memory and music-lyric processing power do have limits. So, in your songwriting, it's important to keep individual VM phrases

fairly short most of the time, and leave adequate intervals between VM phrases.

- ***Singers need time to breathe.*** Blindingly obvious as this may seem, some songwriters create VM phrases with such short rests between them that vocalists who have to sing them find themselves short of breath (and cursing). Another reason to leave sufficient space between VM phrases.

- ***Singers can't deliver intelligible lyrics at breakneck speed.*** The human vocal apparatus has its limits. Even the rapper Twista, reputedly one of the fastest in the business, can't deliver lyrics nearly as fast as a competent instrumentalist can play melodic phrases on, for instance, a keyboard or guitar or sax. Not only that, as vocal delivery speed increases, intelligibility decreases, defeating the presumed artistic function of lyrics. So, when constructing VM phrases, it's wise to refrain from jamming 24 syllables into a single bar. Compared with ordinary speech, singers deliver song lyrics significantly more slowly.

If you play purely instrumental music, the distinction between melodic phrases and structural phrases matters much less than it does in vocal music such as popular songs. In music composed for instrumental performance, melody usually continues uninterrupted throughout the piece, passing from instrument to instrument if the piece is performed by an ensemble such as an orchestra or a jazz group.

Some musicians feel that, in any piece of instrumental music, it's the melody that matters most, so having gaps in melody hardly makes sense. Melody is still structured in phrases, but without substantial rests between melodic phrases.

Groups performing popular music understand the central role of melody, and inserting instrumental solos between VM phrases, and often in accompaniment with VM phrases. Although the above-noted restrictions on vocal phrasing do not apply to inserted instrumental solos, players have to be careful that solos do not compete with lyrical delivery and erode intelligibility.

8.3.2
AABA AND ALL THAT

As you know, practically all songs are comprised of certain identifiable components:

- Verse
- Pre-chorus (a phrase between the verse and chorus)
- Chorus
- Middle Eight (or bridge, or release)

Many songwriters think you have to construct songs according to specific formulas. You're supposed to write in "AABA" form (verse, verse, middle eight, verse) or "ABAB" (verse, chorus, verse, chorus) or AAA (verse, verse, verse), and so on.

The problem with this way of conceptualizing form in popular music is that it's too simplistic to reflect how great songwriters use binary form in many ingenious ways to accommodate the brain's evolved music- and language-processing machinery, especially given the constraints of short term/working memory.

What is "AABA" form supposed to mean? For instance, what does "A" mean? Is "A" a VM phrase? Is it a structural phrase? A period at slow tempo? Two periods at slow tempo? Two periods at fast tempo? Four bars? Four periods? Eight bars? Sixteen bars?

If you reckon "A" as a verse, then Gershwin's "Summertime" is in "AA" form—two 16-bar verses. But if you consider the *internal form* of each verse, the four four-bar phrases are structured as "ABAC."

Now, no one would argue that verses and choruses and middle eights have no reality. Everybody knows about verses and choruses, even people who have never written songs and never will. It's just that, if you want to improve your songwriting technique, you'll find it more useful to master the *constituent structural units* that make up verses and choruses and middle eights, namely, VM phrases, structural phrases, and periods.

As long as you keep binary form and the Wundt curve in mind, you can string together verses and choruses and middle eights in any order you please, without fear of boring or confusing listeners.

In rap, beginning the song with the chorus is common. In non-rap songs, it's not standard, but it works. It worked for Lennon-McCartney: "Don't Let Me Down," "Good Day Sunshine," "Good Morning Good Morning," "Help," "Can't Buy Me Love," to name a few. It also worked for George Harrison: "Here Comes The Sun."

Returning vs Continuing Form

If you consider only the large blocks that make up songs, you can categorize song form in quite a few ways. For instance, you can distinguish between *continuing* or *chain* form, and *returning* or *circular* form.

Continuing (chain) form refers to songs that have only one VM phrase (or one melodic phrase if there are no lyrics) or one period that's repeated ("chained together") throughout the entire song. That gives the song unity. Lyrical diversity and minor melodic modifications provide variety.

Here are a few examples:

- "Helpless" (Neil Young)
- "The Wreck Of The Edmund Fitzgerald" (Gordon Lightfoot)

- "Drifter's Escape" (Bob Dylan)
- "Knockin' On Heaven's Door" (Bob Dylan)
- "500 Miles" (West-Bare-Williams)
- "Bolero" (Maurice Ravel)

Returning (or circular) form refers to any song that has at least two periods, each containing a different VM phrase (or related set of short VM phrases). If you label the first period "A" and the second one "B", the song is structured such that it "returns" to "A" at some point, completing the circle. Returning form would therefore apply to more than 99% of all songs. Any song with verses and choruses, or verses and a middle eight.

Even songs that appear to be in AAA (continuing) form—a series of verses without a chorus or middle eight—are actually in returning form. The verse is almost always comprised of either two or four different periods, which alternate.

UNITY AND VARIETY IN RAVEL'S "BOLERO"

Why did Ravel's "Bolero" become one of the world's best-known instrumental pieces?

It balances unity and variety almost to perfection. Top of the Wundt curve.

- ***Unity.*** Two things strongly unify the piece: 1) the snare drum ostinato, and 2) the single melody that repeats over and over and over. So, even though it's a 15-minute orchestral piece, you have no trouble remembering that dang tune upon hearing the whole piece only once—unlike a 15-minute symphonic movement.

- ***Variety.*** "Bolero" is scored for a large orchestra. Various wind instruments play the melody sequentially. You're never sure which instrument is going to pick up the tune next. The melody varies a bit (but not much) as the piece unfolds. As well, the piece starts softly with only a few instruments. Gradually more join in, and by the end, the whole orchestra is playing loudly. That's why the piece has considerably less impact if it's played by a small ensemble—unless it's shortened substantially.

"Standard" vs "Classic"

People often use the terms "standard" and "classic" interchangeably, as in "As Time Goes By" is a standard, or "As Time Goes By" is a classic. But there was a time, in the heyday of Tin Pan Alley, when "standard" meant a specific song form, the *standard* song form that music publishers demanded of their songwriters: AABA, or verse, verse, bridge, verse. Depending on tempo, each section could be eight bars or sixteen bars.

"As Time Goes By" is both a classic song and an AABA "standard." Each section is an eight-bar period.

8.3.3
MAIN FORMS IN "SERIOUS" WESTERN MUSIC OF THE COMMON PRACTICE PERIOD (1600 - 1900)

> Opera is when a guy gets stabbed in the back and, instead of bleeding, he sings.
>
> —ED GARDNER

Composers of formal music of the common practice period developed a number of musical forms that became more or less standard models for extended works. Here are some of the main ones:

- ***Fugue.*** A composition in imitative counterpoint, where one instrument (voice) states a melodic theme, then others follow in succession, repeating ("imitating") the theme. A specialty of J. S. Bach.

- ***Sonata.*** An instrumental composition in three or four movements for a solo instrument (e. g., a piano sonata; a violin sonata) or a small ensemble (e. g., sonata for piano and violin). Sonata also refers to a specific musical structure, *sonata form,* with three sections: exposition, development, recapitulation, then a coda (a short section that ends a piece). Sonata form is characteristic of the first movements of sonatas, symphonies, string quartets, etc.

- ***Symphony.*** An extended composition for full orchestra, usually in four movements.

- ***Suite.*** A set of short, disparate instrumental pieces or movements with some unifying characteristic (e. g., all dance pieces), usually performed as a unit.

- ***Concerto.*** A composition in several movements (usually three) for one or more solo instruments and orchestra.
- ***String quartet.*** A composition in four movements for two violins, viola, and cello.
- ***Rondo.*** An instrumental composition in which an initial theme alternates with new themes (A B A C A etc.). The last movement of a sonata or a concerto is often in rondo form.
- ***Opera.*** An extended dramatic work in three or four acts in which characters sing their dialogue with continuous accompaniment of orchestra and chorus.
- ***Cantata***. A composition for several solo vocalists, chorus, and instrumental accompaniment, based on a sacred or, less often, a secular text. Another specialty of J. S. Bach.
- ***Oratorio.*** A composition for soloists, chorus, and orchestra, usually (but not always) based on a Biblical theme. Similar to a cantata but on a larger, more extended scale. Probably the best-known oratorio is Handel's *Messiah*.

8.4 Form: Unity, Variety, and Emotional Impact

8.4.1 OPTIMIZING UNITY AND VARIETY IN SONG FORM

Table 66 below summarizes the main points to keep in mind when considering structure in song form.

"Default" Form

If you don't have a lot of experience writing songs, stick to "square" form: four-bar structural phrases, eight-bar periods, 16-bar verses. Countless successful songs have this exact structure, so you can't go wrong, form-wise. It's the "default form" of popular song, the structural equivalent of the diatonic major scale in melody, or the circular harmonic scale in harmony, or simple quadruple meter.

Once you're satisfied that you can write palatable songs in default form, you'll feel more comfortable experimenting with structural variety, such as creating periods with fewer than eight bars or more than eight bars.

TABLE 66 Optimizing Unity and Variety in Song Form

	Prefer…	Instead of…
Phrase Types	• Distinguishing between VM phrases and structural phrases	• Thinking of phrases only in terms of melodic groups or only in terms of structural units
Gestalt Principles	• Recognizing the unifying value of Gestalt pattern-recognition principles: proximity, similarity, continuation, and closure	• Ignoring pattern recognition principles and creating unstructured music
Song Form	• Using binary structure as the foundation of song form • Using the period (a pair of related phrases) as the principal building block	• Considering the large structural units of verse, chorus, middle eight, etc., as the principal building blocks
VM Phrase Spacing	• Leaving significant space between VM phrases	• Creating run-on VM phrases with inadequate intervals between them

VM Phrase Beginnings	• Varying VM phrase beginnings from song to song: - Before beat 1 of bar 1 (anacrusis) - On beat 1 of bar 1 - After beat 1 of bar 1	• Using the same type of VM phrase beginning in every song, especially the default (before beat 1 of bar 1)
Lyrics and Their Metrical Position Accents	• Adhering to the Accent-matching Law most of the time when setting words to music (or vice-versa)	• Ignoring the Accent-matching Law

8.4.2 EMOTIONAL EFFECTS OF SONG FORM

Table 67 below lists some reported emotional effects of structural phrases.

TABLE 67 Emotional Effects of Various Characteristics of Structural Phrases

Structural Phrase Characteristic	Associated Emotions
Clear, predictable, low complexity	Happiness, joy, peace, relaxation
Unorganized; lacking clear patterns; chaotic	Anger; fear
Complex	Tension, sadness

9

How Melody and Melody-harmony Integration REALLY Work

A melody is a series of tones that makes sense.
—VICTOR ZUCKERKANDL

9.1
Evolution, Music, and Emotional Arousal

9.1.1
WHY MUSIC IS ALL ABOUT EMOTION: EVOLUTION AND THE ADAPTIVE PURPOSES OF THE EMOTIONS

Only emotion endures.
—EZRA POUND

Evidence on the evolutionary origin of music lends support to the view that if music is "about" anything, it's about the melody. That melody is the soul of music. (Everything is the soul of something, it seems. Ethanol is the soul of beer.)

Apart from lyrics, it is the melody, including melodic rhythm, that most people remember about a song. Harmony, while important, does not usually stick in long-term semantic memory the way melody does.

As discussed in Chapter 1, animal calls—the non-human equivalent of tunes—are emotional in nature. Emotions evolved as adaptations with enormous survival value.

We humans are animals that vocalize in part to communicate information (language) but also to communicate our emotional state. A human mother and her baby use melodious vocalizing, among other things, to attune to each other emotionally. Since music communicates emotion, it may well owe its evolutionary origin to the survival value of inherently musical mother-infant communication.

Music, the saying goes, is the language of emotion. Even pre-school children can accurately identify specific emotions that music elicits. If the adaptive purpose of music is to communicate emotion, and if music is "about" melody, then clearly *a melody that fails to communicate emotion fails as music.* This chapter explores some of the ways you can improve the odds that you will create melodies that succeed musically by communicating emotion.

ANIMAL LANGUAGE TRANSLATORS

Male mice sing when they encounter female mice. Isn't that nice? Men mice sing love songs to attract women mice. Alas, male mice sing at frequencies of 30 to 110 kHz—far above the range of human hearing. So humans never hear their melodious serenading as they scurry through the house at night, avoiding traps.

Dogs and cats don't sing, but they make emotional noises well within human hearing range. So, naturally, humans have found a way to cash in on the unworldliness of pet owners who think dog barks and cat meows mean something specific, other than "hey!" A Japanese company successfully markets "dog translators" and "cat translators" to gullible pet owners, providing more evidence that pets are more intelligent than their owners. So far, hundreds of thousands of credulous humans have shelled out $75 to $100 for the devices, but no dogs or cats have paid for "human translators."

Dialogue Is Not Enough: Emotion and Film Music

In a novel, the writer describes for you, without dialogue, the interior lives of characters: what they're thinking and how they're feeling emotionally. In a film, you have action, dialogue, facial expressions—and *music.* Movies hardly ever lack a musical sound track. Music arouses the emotions of an audience. Through music, the audience shares characters' emotional experiences.

Even in the era of the so-called "silent movie," a musician—typically a pianist or organist—played along with the movie to provide the emotional experience associated with characters' actions. Then "talkies" came along and the film-music industry briefly died away. Movie makers quickly discovered that, even with audible dialogue and other sound effects, something was missing. Talkies without music were emotionally impoverished. Soon, movie makers restored music to the cinematic experience, and music became as essential to talking pictures as it had been to silent films. Music has remained a central aspect of the movies ever since. Psychologist Annabel Cohen, a specialist in music cognition, sums up the role of music in film:

> The capacity of music to accomplish the emotional task ... may be based on the ability of music to simultaneously carry many kinds of emotional information in its harmony, rhythm, melody, timbre, and tonality. Real life entails multiple emotions, simultaneously and in succession. Miraculously, yet systematically, these complex relations—this 'emotional polyphony'—can be represented by the musical medium.

Music is usually lacking in stage plays other than musicals because of synchronizing. In live theatre, no two live productions are the same each night. Also, music costs more money than theatre companies can afford.

9.1.2 EMOTIONAL REACTIONS AS RESPONSES TO SURPRISE OR CHANGE

You have an emotional response when you experience surprise or uncertainty—the discrepancy between what you expect to happen and what actually happens. You experience *positive* or *negative* emotions, depending on whether the unexpected event improves or threatens your survival prospects or your capacity to send your genes into the future.

One of the main reasons you remember exciting events much better than ordinary experiences is that adrenaline enhances the formation of memories. It speeds up

memory-making. When you experience a big surprise—positive or negative—you feel a surge of adrenaline and react emotionally.

- You're walking along the main street of Dodge, minding your own business, when suddenly—surprise!—a pack of snarling wild dogs bursts out of the Wrong Ranch Saloon and charges straight at you. Rush of adrenaline. Negative emotional reaction.

- You check your lottery ticket numbers, expecting nothing again this week (as every week for the past 14 years). Instead—surprise!—you discover you've won $87,412,162.19. Rush of adrenaline. Positive emotional reaction.

When you hear a piece of music, it begins by creating a world of tonality and regular beat. Sequences of chords and tones and phrases set up "normal" expectations.

As the song unfolds through time, your brain tries to predict what will happen next, based on what's already happened. Too much successful prediction causes disinterest and boredom. Too little leads to confusion.

For instance, when you hear a V7 chord, you anticipate that it will resolve to the tonic chord. If your brain's prediction turns out wrong—the resolution does not happen when you expect it to happen—you're surprised, uncertain about when the resolution will happen. You experience *emotional arousal.*

The longer the delay, before the V7 chord resolves, the more intense the emotional arousal. If the V7 chord then progresses to a chord other than the tonic chord (deceptive cadence), emotional intensity increases even more. When resolution to the tonic finally comes, you get another emotional jolt, a rush of *pleasure*.

> **The best music elicits both negative and positive emotions by continually *creating uncertainty*— violating expectations—and then *resolving the uncertainty*.**

This goes on simultaneously in all the elements of a song as it unfolds in time:

- ***Harmony:*** The chord progression wanders away from the tonic chord, challenging tonality with chords other than simple triads. (As discussed in earlier chapters, different chord types elicit different kinds of emotions.) But sooner or later, tonality gets the upper hand and uncertainty is resolved.

- ***Melody:*** The tune challenges tonality by wandering away from the tonic note, forming complex-ratio intervals, creating uncertainty, which is allayed when, every so often, the tune returns to the tonic note.

- ***Rhythm:*** VM phrases and instrumental solos create uncertainty in the way their rhythm patterns contrast with the (completely predictable) underlying beat. VM and instrumental solo phrase patterns usually repeat every two or four or eight structural bars, alleviating the uncertainty.

- ***Form:*** In many songs, structural phrases vary unexpectedly from the four-bar norm, creating uncertainty. (An example discussed later in this chapter is "Hey Ya" by Outkast.) An unusual structure usually repeats many times throughout the song, creating a pattern that becomes familiar and relieves the uncertainty.

- ***Lyrics:*** Meaning keeps changing in the verses, creating uncertainty. Some phrases keep recurring in the form of a chorus, creating familiarity that dispels the uncertainty to a degree. If there's no chorus, repeated words or phrases in the verses serve the same purpose.

As discussed in Chapter 7, emotionally significant experiences are stored in episodic memory and "emotionally tagged." If you perform a set of songs that arouses an audience emotionally, they will remember that experience, especially if you give them some musical moments so surprising and startling that they experience an adrenaline rush or two. They will remember you and your performance. And they will buy your music.

But if you perform a set of songs that fails to stir them emotionally, they will not remember the experience. Or you.

Music increases general emotional arousal, but not everyone necessarily has the same specific kind of positive or negative emotional experience. Music can and does trigger many kinds of emotion simultaneously and also in succession. For example, a song may induce a similar intensity of emotional arousal in two people, but one may feel intense anxiety while the other feels intense excitement.

People enjoy emotionally-charged music, *even if the valence is negative* and the intensity is strong. Like going to a movie or listening to a story, the context is controlled. (See Section 2.4.3).

Avoiding Habituation

As a songwriter, you want your songs to elicit some kind of emotional response in your audience. Empirical evidence shows that music actually creates expectations. If you play a melody for a listener, then stop it suddenly, the listener has a pretty clear expectation of how the tune "ought" to continue.

Although repetition is essential in music, if a musical element becomes too predictable, if there's not enough change or variety, habituation sets in, which *decreases* emotional arousal (left side of Wundt curve). To avoid habituation, it's

necessary to keep introducing novelty in one or more elements throughout the song: new melody, lyrics, chords, instrumental solos, background harmonies. For example, it's common for lead instruments to play solos in the gaps between VM phrases, and between the main sections such as the verses, choruses, and the middle eight.

9.1.3 EVERYBODY'S ON DRUGS: NATURAL, BRAIN-MANUFACTURED DRUGS

Pleasurable activities such as eating stimulate pleasure centres in the brain, rewarding and reinforcing behaviour that has clear survival value. Listening to music and making music cause the brain to generate natural pleasure-inducing drugs. As discussed in Chapter 1, the pleasure you get from music, like the pleasure you get from eating, has survival value, or music would not have evolved as an adaptation.

Non-medical hedonic drug-taking stimulates pleasure centres but has no survival value. The effects wear off due to habituation, but you remember what caused the pleasure, which may lead to addiction—clearly a survival disadvantage. Natural selection designed pleasure to be fleeting. If whatever made you happy did not wear off, you would only do it once.

Hedonic drug-taking only began when humans discovered how to manufacture and ingest drugs that the brain mistakes for natural, brain-created drugs. It's a cultural phenomenon that has been around only for a few millennia in some regions of the world, and a few centuries in other regions.

THE SACRED DRUNKEN MOOSE OF SWEDEN

In 2004, soprano Birgit Nilsson became only the second Swede ever to win the coveted Moose Nobel Prize in Music, the world's most prestigious music prize (see Appendix 3).

Speaking of moose, every autumn across central Sweden, moose get drunk on apples that have fallen and fermented. The moose lose their inhibitions and wander into cities and towns, looking for a good time and getting into trouble. Sometimes they attack people without provocation. Occasionally they stagger into houses and wreck the Ikea furniture.

But Swedes love and forgive their intoxicated moose. Why? Because Swedes consider the moose a sacred animal, which explains the shock and awe the H.U.M.S. members experienced

when the original Moose Verdi galloped up to them, outside the Swedish Academy of Music back in 1901.

In Sweden, hunters are not allowed to shoot sacred moose, just as hunters are not allowed to shoot sacred cows in India. In fact, the Swedish home furnishings giant Ikea uses an image of a sacred moose as its sacred company mascot and sacred corporate logo. Ikea has worked out an arrangement with the Swedish government whereby, if a hunter in Sweden goes out into the bush and shoots a moose, Ikea will fly in a bounty hunter from Dodge City to track down and shoot the moose hunter. (Marshal McDillon loves this gig, as it gives him the opportunity, while in Sweden, to shop for Ikea home furnishings that you can't get in Dodge.) Fortunately, Ikea has only had to dispatch bounty hunters a dozen or so times, as the great majority of Swedes are law-abiding and respect the sacred place of the moose in the Swedish way of life. In fact, if you look hard enough on the Internet, you will even find Swedish moose fetish cults, usually affiliated with Swedish thrash and death metal bands such as the seminal band, Moose at the Gates.

Here's a brief account of how various hedonic drugs work in the brain, summarized by Steven Johnson in *Mind Wide Open*:

> [The drug] ecstasy floods the brain with excess serotonin. Cocaine increases the availability of dopamine, noradrenaline, and serotonin. Hallucinogens like LSD achieve some of their effects by imitating the serotonin molecule. Amphetamines release dopamine and noradrenaline. Nicotine mimics dopamine molecules, as well as activating nicotine receptors. Alcohol and other tranquillizers have a more generalized effect, decreasing the activity of GABA [gamma-aminobutyric acid, an inhibitory neurotransmitter] in the brain. Opiates, as their name suggests, pass for the brain's naturally occurring opioids.

Research on motivation for choosing a career in music indicates many performers claim to choose music as a profession for hedonic reasons. They simply want to keep experiencing the pleasure, the emotional rush that music induces.

The brain's main pleasure-drugs are the opioids and oxytocin, the "love drug" associated with childbirth, romantic attachment, and social bonding. Animals fail to form pair bonds when researchers block their brains' oxytocin receptors. Evidence indicates music may trigger the release of oxytocin. David Huron, a specialist in music cognition, explains that:

> Although in contemporary society music tends to be experienced in a personalized or individualized listening context, we already know

that this context is historically unprecedented. Most music making in hunter-gatherer societies occurs in a social or group context. Until the invention of the phonograph, the vast majority of music in Western culture was also experienced in social or group contexts.

The pleasure associated with music in a "group context" drives people to seek music to regulate moods—get out of a bad mood, relieve anxiety—by, for example, going out with others to a club or concert.

The emotional effect of music subsides when the music ceases, but you remember what it was that aroused that emotion. Which is why you can listen to the same piece of music time after time and derive pleasure from it. Each time, the music triggers a little drug rush in your brain and you feel the related emotion.

ROMANTIC LOVE = OBSESSIVE-COMPULSIVE DISORDER

Speaking of being on brain-manufactured drugs, what *is* the difference between being in love and suffering from obsessive-compulsive disorder?

Not much, apparently.

A controlled study comparing patients with obsessive-compulsive disorder with people in love and "normal" people (not in love) revealed strong neurochemical similarities between the obsessive-compulsives and the "in-loves."

See "Love Is The Drug" on the *Gold Standard Song List* for more information.

9.2 Melody, Memory, and Memes

9.2.1 HOW SONGS FUNCTION AS POWERFUL *MEMES*, REPLICATING AND MUTATING LIKE GENES

In his landmark book, *The Selfish Gene,* Richard Dawkins introduced the concept of the *meme* (rhymes with "team"), the unit of cultural transmission. Memes have gene-like properties. Anything humans create, hold in memory, and pass on to future generations and other members of the same generation is a meme.

A song that becomes a classic is a successful meme.

Memes have properties analogous to the those of the gene, the unit of biological transmission. Robust memes live on, get transmitted throughout the population and become part of the "meme pool." Feeble memes are forgotten—they become extinct. Feeble memes include nearly all of the mediocre original songs written by nearly all (clueless) songwriters.

Memes propagate via a process analogous to, but not the same as, Darwinian natural selection. The mechanics of Darwinian natural selection apply:

1. **Selection.** Selective pressure must exist. Memes evolve to fit imposed environmental conditions (differential fitness, or survival of the fittest). For example, if a song causes enough people to experience enough pleasure, they will remember it and the song will become a classic, such as Dylan's "All Along The Watchtower," especially the Jimi Hendrix cover recording.

2. **Variation.** Variability must exist. Songs are created in many genres. Any given song can be performed and recorded in any number of styles by any number of artists. The searing Hendrix recording of "All Along the Watchtower," much different from Dylan's original acoustic rendition, has always been far more popular.

3. **Heredity.** Replication must occur in order to pass on memetic mutations to future generations. Many more people learned "All Along the Watchtower" and passed it on to others because of the Hendrix version (a mutation) than would have been the case had Hendrix not covered the song.

A large number of memes can exist as "meme complexes." Religions and political parties, for instance. In music, a style or genre is a meme complex.

This does not mean that there's such a thing as "cultural evolution." There isn't. Memetics merely explains how ideas—memes—spread through populations. Songs, for example, do not come about because of song mutations. Creative songwriters dream up songs. The natural selection analogy does not apply to the *origin* of memes such as songs—only to the way memes propagate.

A meme is a physical, biological entity. Every song you know, for instance, exists in your brain (your long-term semantic memory) in the form of a network or networks of neurons. When you teach somebody a song, that person forms the same or similar neuronal structure in his or her brain. You have propagated your song-meme.

Unlike genes, which can only propagate from generation to generation though time, memes can propagate "horizontally"—throughout a population of the *same generation*. Anything that humans create and can hold in memory and pass on to future generations is a meme. A song, for instance.

9.2.2
WHY MOST OF THE WORLD'S BRILLIANT TUNES HAVE NOT YET BEEN COMPOSED

The memes we call tunes can exist in practically infinite variety because music is *combinatorial*, like language and the genetic code. Some songwriters think that all the great melodies have already been composed ... there will never again be songwriters and composers as great as, say, Mozart or Lennon-McCartney or Chopin or Ellington or Schubert or Kern or any other great composer you care to name.

Rubbish.

How many possible tunes are there? To get an idea, consider the number of combinations you have to choose from. Suppose you start with some conservative restrictions, such as:

- A compass of 19 semitones, the pitch range of "The Star Spangled Banner"
- A note value no longer than one bar in duration (four beats in simple quadruple meter)
- A note value no shorter than one-eighth of a bar in duration

Almost anyone could sing any tune you might create within these parameters.

At the beginning of bar one, you have a choice of 20 notes (19 semitone *intervals* = 20 *notes*) or a *rest*, for a total of 21 note possibilities, if you think of a rest as a "silent note." Each note (or rest) can have one of eight duration values.

So, off the top, you have 21 notes x 8 duration values = 168 choices.

Select one.

Now that you've made your first choice, you again have 168 choices for the second note (or rest). The first note (or rest) you selected does not in any way affect your selection of a second note (or rest). Therefore, the number of two-note combinations is 168 x 168 = 28,224.

Continuing on, by the time your tune reaches eight note-rest combinations, the number of possibilities has grown to (in round numbers) 634,600,000,000,000,000. That's 634.6 *quadrillion* possible melodies (at least in America and Canada, but not in the UK, France, or Germany, where *quadrillion* means something different; but who's counting?).

Most tunes have way more than eight note-rest combinations. So the number of possible combinations of singable songs is vastly greater than a mere 634.6 quadrillion.

The number of possible tunes that could be composed in only a few bars is so enormous that, even if only a tiny fraction of them would sound appealing to human ears, humanity would have to exist for many millions of years for songwriters to get around to composing and recording all the possible great melodies.

In other words, most of the world's brilliant tunes are still up for grabs, waiting to be composed ...

"BETTER THAN THE BEATLES"

Well, what can anyone say about The Shaggs? Dot, Heather, and Betty (and sometimes Rachel), the Wiggin sisters, from Fremont, New Hampshire.

An unbelievable band. Unbelievable. A band that played impossible original music for five years (1968 - 1973). *Impossible* music. Nobody in the history of the world has ever played such impossible music.

Frank Zappa is said to have proclaimed that The Shaggs were "better than The Beatles." Indeed. The Shaggs recorded an all-time classic album, *Philosophy of the World*, an impossible album, an album that will probably live on, long after *Abbey Road* is forgotten.

If you've never heard The Shaggs, here's the website:

www.Shaggs.com

Click on the orange "Foot Foot" image at the top of the page and listen in awe to one of The Shaggs' all-time classics, "My Pal Foot Foot."

9.3 Melodic Unity and Coherence

9.3.1 ESTABLISHING TONALITY WITH MELODY

In Chapter 5, you learned about the importance of establishing tonality. You can't create musical uncertainty and the emotion that goes with it until you first establish musical certainty in the form of tonality. Harmonically, you can establish tonality by using the V7 chord, which points unequivocally to the tonic.

Melodically, you can help establish tonality by using scale degrees 1, 3, 4, and/or 5 early in the melody. Particularly in metrically accented positions. You don't have to rigorously use all of these key-defining notes, of course. But the more of them you use, and the earlier, the sooner you will be able to modulate.

Modulation in "Street Fighting Man"

- The verse of the Jagger-Richards classic, "Street Fighting Man," is in the key of C, using only the I and IV chords, and only scale degrees 1 and 4 in the melody.
- For the chorus, the song modulates to the key of G. The melody of the chorus is drawn exclusively from scale degrees 1, 3, 4, and 5 of the new key (the notes G, B, C, and D). This firmly establishes tonality in the new key, G major.
- The modulation is further reinforced when the harmony moves to the V chord of the new key (the chord D major) and melody to the leading tone, F♯, a note that is foreign to the original key, C major.

- The song's musical effectiveness derives from the alternation between two keys, C major for verses and G major for choruses. Skilful use of scale degrees 1, 3, 4, and 5 make the modulation effective.

It's not just for the sake of modulation that it's wise to establish tonality early, using the notes of the key's tonic triad. Once established, you can stay in the same key and go nuts with non-chord diatonic tones, leaps, sequences, and other techniques discussed later in this chapter.

9.3.2 MELODIC COHERENCE AND INTELLIGIBILITY

Music, like prose, has to be intelligible. Audiences don't remember unstructured, inaccessible tunes (extreme right side of the Wundt curve). That applies to the way melodies work within structural phrases, and also to the ways melodies themselves are structured.

Even infants without previous musical exposure prefer coherent melody and harmony. You need a certain amount of melodic and harmonic novelty to create interest, but too much causes confusion and *reduces* interest.

The smallest melodic unit that has any meaning, much as the smallest unit of words in language that has any meaning, is the phrase. And, as with language, successive musical phrases need to be *related to each other* if they are to stick in a listener's memory.

When you write a song, you have to incorporate enough change in the various musical and lyrical elements to keep things unpredictable and exciting, but not so much novelty that coherence melts away.

Later in this chapter, you'll learn some specific techniques you can use to strike the right balance. Top of the Wundt curve.

9.3.3 IMPORTANCE OF A PRACTICAL VOCAL RANGE

The melodies of most great songs range from seven semitones (an interval of a perfect fifth) to 19 semitones (an octave and a fifth). Most people can handle 19 semitones. That's the range of "The Star Spangled Banner."

Tessitura refers to pitch compass or range. Male voices are lower in tessitura than female voices. For example, a woman with a soprano voice and a man with a baritone voice can each sing a tune that spans 19 semitones, but each in his or her

own tessitura. The soprano could not sing the tune in the baritone's tessitura, and vice-versa (except perhaps in falsetto).

Tessitura also refers to the pitch compass of a song or composition. You'll notice that the notes of the verses of some songs cluster in the lower pitch range—tessitura—of the song. Then, in the chorus, the notes cluster in the upper tessitura. The melody may only have a range of 12 to 15 semitones, but the sections are divided tessitura-wise to create contrast.

Think twice before deliberately setting out to write a melody with a low-tessitura verse and a rousing, high-tessitura chorus. Like shift modulation (the dreaded Truck Driver's Gear Change), this practice has been over-done to the point of abuse. As you'll see, there are many other ways to conjure melodic magic.

9.4 Tune and Chord Progression

9.4.1 MELODIC VS HARMONIC FORCE OF INTERVALS

Melody is comprised of intervals, some of which have more harmonic force than melodic force:

- ***Intervals with strong harmonic force*** in a melodic context: fifth, fourth, major and minor thirds. As discussed in Section 9.3, these intervals help establish tonality.

- ***Intervals with moderate harmonic force*** in a melodic context: major and minor sixth. About equally harmonic and melodic.

- ***Intervals with weak harmonic force*** in a melodic context: major second, minor second, major seventh, minor seventh. Seconds are the quintessential melodic intervals.

For the sake of maintaining unity within variety, when melody proceeds in intervals of seconds that land on metrically accented positions, you can use consonant simple triads to ensure that the dissonant seconds—non-chord tones—stand out. (A section on non-chord tones is coming up.)

Conversely, when the melody proceeds in thirds and fifths, you can use dissonant chords to offset the harmonically consonant melodic intervals.

9.4.2
RELATIVE SPEED OF MELODY AGAINST HARMONY: EMOTIONAL EFFECTS

In a well-structured song, chords progress in a non-random, coherent way. They relate to each other, drawn mainly from the circular harmonic scale of the prevailing key (Appendix 1). Simultaneously, the tones of the melody also proceed non-randomly, drawn from the diatonic scale of the same prevailing key. Although melody and harmony unfold at different paces, the two nevertheless relate to each other in such a way as to sound unified.

The correspondence between harmony and melody can take three forms.

1. Harmony Moves Slower than Melody ("Normal" or Default)

This is the default in popular music and most other music that has harmonic motion. Typically chords change every bar or two, sometimes twice in a bar, sometimes only once every four or more bars. The faster the tempo, the more bars go by between chord changes. But, because of the quick pace, elapsed time between chord changes is about the same as at moderate tempo.

2. Harmony Moves Faster than Melody

This is what happens when a tone of the melody is held or extended while the chords change. This technique creates surprise and resulting emotional response—"Why isn't the note moving? When is the note going to change?"—that gets satisfactorily resolved when the note finally resolves and the "normal" succession of tones resumes.

3. Harmony and Melody Move at the Same Speed

When chords change with every melodic note, the overall pace tends to be slow and the emotional effect solemn. Chords have a lot of musical weight or mass, as it were, compared to melodic notes. So when chords change with every melodic note, the brain perceives that a lot of power or energy is being expended to move so much mass so frequently.

Although type 1 above prevails most of the time, great songs sometimes have instances of types 2 and 3, each of which surprises the listener and elicits an emotional reaction.

9.4.3
CADENCE IN ITS MELODIC CONTEXT

In Section 6.6.12, you learned about cadence in its harmonic context, especially the role of the all-important V chord, called the *dominant chord* for good reason.

Most of the time, the chord that accompanies the last note of a VM phrase is either the V chord (an imperfect cadence, also called a half cadence or half close) or the tonic chord (a perfect cadence, also called a full cadence or full close).

The frequency with which cadences occur has major implications for melodic coherence.

> **If cadences involving the V chord occur too far apart, a series of VM (vocal-melodic) phrases will not sound cohesive—one of the most common songwriting mistakes.**

As you'll see later in this chapter, VM phrases tend to occur in groups of two or four within eight-bar structural phrases. The first VM phrase of a pair (or pair grouping) usually ends on the V chord or the tonic chord. Sometimes it ends on some chord other than V chord or the tonic, such as the IV chord or the IIm chord.

If a VM phrase starts with tonic chord accompaniment and the melody includes notes of the tonic chord (scale degrees 1,3, and 5), tonality is established firmly enough that the intermediate cadence can be some formulation other than V7 – I. But, for the sake of melodic coherence, the V chord is likely to enter the picture in a cadence position somewhere in the eight-bar period.

There are no set cadence formulas. But there's no question that the V (or V7) chord and the V7 – I perfect cadence work wonders in holding a melody together structurally. Few great songs go on for 16 bars without a single instance of a V or V7 chord resolving directly or indirectly to the tonic chord.

Cadence, Continuation, and Conclusiveness

Melody has harmonic implications, and vice versa. You can't really disentangle the two. *Cadence is equal parts harmonic and melodic.* The note on which a VM phrase ends, and the chord that accompanies it, together constitute a cadence.

For a feeling of *continuation*, the chord progression accompanying a VM phrase usually ends on:

- The V or V7 chord; or
- Some other chord *non-tonic* chord such as IV or IIm or VIm; or
- A variant of the tonic chord, such as the seventh (e.g., C7 in the key of C major).

Melodically, in a "continuing" cadence, the VM phrase lands on some note other than the tonic.

A continuing cadence tends to occur at the end of the first of a pair of VM phrases, with the second VM phrase ending on the tonic note.

For a feeling of *conclusiveness*, the chord progression typically moves from V7 to the tonic chord. But when the chord progression moves to the tonic chord, conclusiveness may not be absolute. It depends on where the melody lands.

The melody usually lands on one of three scale degrees:

- Scale degree 1, the most conclusive-sounding
- Scale degree 5, less conclusive-sounding
- Scale degree 3, still less conclusive-sounding

If a cadence consists of the tonic chord combined, melodically, with scale degree 5 or 3, it often functions as a continuing cadence, despite the tonic chord harmony.

One of the most common and structurally sound ways to write a period is to end the first phrase with some type of continuing cadence, and the second with a conclusive V7 – I cadence with the melody landing on scale degree 1. But this is by no means a stock formula.

Melodically, the two VM phrases may be similar, in a sequential relationship (more on sequences later in this chapter). Or they might contrast, as for example, when the first VM phrase ends on a note either considerably higher or considerably lower than the first note of the phrase, and the second VM phrase takes the melodic line back to the opening note.

Masculine vs Feminine Cadence

A *masculine cadence* occurs when the final note of a VM or melodic phrase falls on a metrically strong beat:

- The first or third beat of the second, third, or fourth bar in quadruple meter
- The first beat of the second, third or fourth bar in triple meter

A *feminine cadence* occurs when the final note of a vocal or melodic phrase falls on a metrically weak beat:

- The second or fourth beat of the second, third, or fourth bar in quadruple meter
- The second or third beat of the second, third or fourth bar in triple meter

Practically every popular song has masculine cadences. Which is why *feminine cadences tend to stand out*. If you hear a feminine cadence, it's usually in an

intermediate structural position, such as the second bar of a structural phrase. In which case it's usually followed by a masculine cadence in the fourth bar.

A good example of an intermediate feminine cadence is the opening two-bar VM phrase of Gordon Lightfoot's "If You Could Read My Mind." The last note of the VM phrase (the word "love") falls on the fourth beat of the second bar. What makes it stand out, apart from being a feminine cadence, is that the last melodic interval *leaps* from scale degree five ("mind") up to the tonic ("love"), an interval of a perfect fourth, which gives the last note a striking pitch accent on the *off-beat*.

Occasionally, a creative songwriter will use a feminine cadence at the end of a structural phrase or period, where such cadences seldom occur. An example is the last four-bar phrase of the verse of the Lennon-McCartney song, "Golden Slumbers" —the vocal line, "Sleep, pretty darling, do not cry ... and I will sing a lullaby-ee."

Here are the last two bars. The chord progression is the standard full-close V7 – I:

Chords	**V7** (Dominant 7th)	**I** (Tonic)
Metrical Accents	● • ● •	● • ● •
Words and Pitches	*sing* *Will a* *I* *And lul-* *la*	*ee* *by-*

The effect is particularly striking because, not only does the feminine cadence occur at the end of a period (and the end of a verse, repeated at the end the chorus), but the last interval ("by-ee") is a big leap, from the scale degree three up to the tonic, an interval of a minor sixth (eight semitones). A startling, unexpected pitch accent that seizes the listener's attention.

CHRIS BLISS: THE BIG FINALE

If you have never seen the Chris Bliss "Golden Slumbers" finale, go to www.ChrisBliss.com, look for the video press kit, and click on The Big Finale video. Turn up the sound and be astonished for the next four and a half minutes.

9.5 VM Phrases Within Structural Phrases: From Weill and Brecht to Bowie and Beck

9.5.1 BINARY STRUCTURE AT THE PERIOD LEVEL

Experimental evidence indicates that, to make a tune memorable, chunking and Gestalt grouping principles must apply. Chapter 8 emphasized the main unifying structural factor in songwriting: four-bar structural phrases forming eight-bar periods. They dominate, regardless of genre, meter, tempo, verse-chorus structure, etc. Within a pair of structural phrases, VM phrases can be short or long, and arranged in a variety of ways.

This section presents 16 pairs of structural phrases (periods) from 16 different *Gold Standard* songs, showing the positioning of VM phrases within each eight-bar period.

9.5.2 WUNDT CURVE ANALYSES

Each of the 16 songs examined has been successful over the long term, both artistically and commercially, because the songwriters managed to balance unity and variety. Each song perches atop the Wundt curve.

How did the songwriters do it?

The Wundt curve analysis for each example provides an explanation with respect to the structural aspect. Read and understand the commentary for each example, apply the techniques to your own songwriting, and you'll have another tool at your disposal that will help you create tunes that are far superior to the lame melodies of 99% of songwriters.

If you're keen, draw your own grids and sketch in the remaining periods and VM phrases for each of the 16 songs. You may also wish to re-visit Section 8.2.3, "Techniques of Variation within Binary Structure."

Try doing your own Wundt curve analyses of the VM phrases not shown in the 16 examples.

- How do great songwriters achieve unity (left side of the Wundt curve)? As you'll see in the examples, the answer in most cases is not simply "exact repetition." It's more subtle than that. Those subtleties spell the difference between greatness and mediocrity in creating VM phrases and positioning them in structural phrases. So reflect on the details.

- And how do great songwriters simultaneously achieve variety (right side of the Wundt curve)? Again, you'll learn how if you study the details in the commentary.

Pay particular attention to the *balance* between unity and variety in each example.

To get even more practice, do some sketches, like the ones in the examples, of other songs that have stood the test of time, and that you personally admire. Determine meter, tempo, vocal start points with respect to beat one of bar one of structural phrases, VM phrase positioning within structural phrases, VM phrase lengths, intervals between VM phrases, use of sequences, and so on. Most importantly, do Wundt curve analyses to learn the details of unity-variety balance. The more you do this, the more you will improve your understanding of how to consistently create emotionally powerful tunes.

9.5.3
16 EXAMPLES

These 16 examples represent nearly all the major genres, the most commonly used meters, all four of the tempo ranges, and all three of the possible VM phrase start points with respect to structural phrases.

In each diagram:

- The VM phrases are indicated in black, the intervals between the VM phrases in white.

- Capital letters (A, B, C ...) identify different VM phrases within an eight-bar period. If the VM phrase repeats after an interval, the repeated VM phrase(s) has the same letter designation. In such cases, the melody usually repeats but the words are usually different. Not always, though.

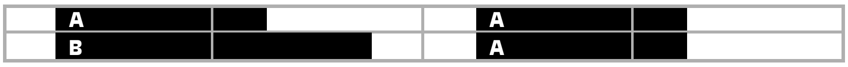
- Where numbers follow capital letters (A1, A2), the second VM phrase repeats melodically as a *sequence* (repetition at a different pitch).

Each diagram represents only *eight bars* of the song—not the whole song. Go to a music download website, get any of the recordings of the 16 songs that you don't have (the original recording by the songwriter, except where indicated in the examples coming up) and use them to follow the commentary about each eight-bar period.

---

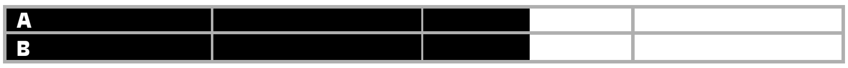
1. "Space Oddity" (David Bowie)

Meter: **Simple quadruple**
Tempo: **Slow** (65 BPM)
Vocal starts: **After** beat 1 of bar 1 of the structural phrase
Song part: **Verse**
Wundt curve: **Left side/unity:** The first VM phrase ("A") occurs 3 times—both words and music—in only 8 bars. **Right side/variety:** The "B" VM phrase starts in the same metrical position as the first "A" VM phrase (more unity), but is longer and has a contrasting melody and different words.



2. "Take the 'A' Train" (Billy Strayhorn; REC: Duke Ellington; Ella Fitzgerald)

Meter: **Combined quadruple**
Tempo: **Lively** (174 BPM)
Vocal starts: **On** beat 1 of bar 1 of the structural phrase
Song part: **Verse**
Wundt curve: **Left side/unity:** Both "A" and "B" VM phrases are the same length; they begin and end in the same positions within their respective structural phrases. In both VM phrases, the first note is held for a little more than 1 full measure. **Right side/variety:** The "A" and "B" VM phrases contrast—different tunes, words, melodic rhythm, numbers of note-syllables. This song is in up-tempo combined quadruple meter, now common in hip-hop.

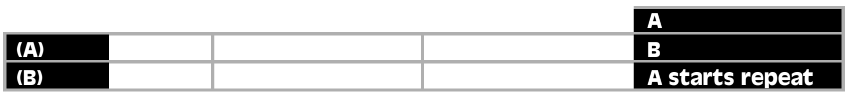


3. "I'm So Lonesome I Could Cry" (Hank Williams, Sr.)

Meter: **Combined triple**
Tempo: **Moderate** (112 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Verse**
Wundt curve: **Left side/unity:** 3 iterations of the same prominent melodic interval (a major third) in the first VM phrase, 2 iterations in the second VM phrase. **Right side/variety:** The second instance of the VM phrase begins in the same metrical position as the first, and has the same tune, but contrasts because it is truncated by 1 bar. The 2 VM phrases also have different words. As well, this song is in combined triple meter—not common in popular songs—which makes it stand out.

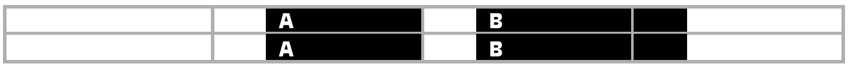
4. "Superstition" (Stevie Wonder)

Meter: **Simple quadruple**
Tempo: **Fast** (200 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Verse**
Wundt curve: **Left side/unity:** The "A" and "B" phrases have identical numbers of notes (6) in their melodic rhythms. An identical instrumental riff occupies the long interval following each VM phrase. **Right side/variety:** The tunes and words of the 2 VM phrases are different. Also, the 2 VM phrases begin a full bar before beat 1 of bar 1 of the structural phrases. A long anacrusis commands attention because it's unusual.



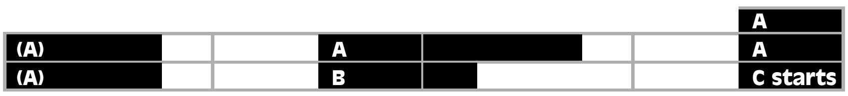
5. "Brown Sugar" (Jagger-Richards/The Rolling Stones)

Meter: **Simple quadruple**
Tempo: **Moderate** (128 BPM)
Vocal starts: **After** beat 1 of bar 1 of the structural phrase
Song part: **Chorus**
Wundt curve: **Left side/unity:** The musical elements of the"A" and "B" VM phrases repeat exactly in the second structural phrase. Also, the lyrics are the same in the 2 iterations of the "A" VM phrase (the words, "brown sugar"). **Right side/variety:** 2 different VM phrases within each structural phrase. The words are different in the 2 iterations of the "B" VM phrase. Also, the first VM phrase within each structural phrase begins far into the structural phrase—the second beat of the second bar. Unusual and ear-grabbing—the opposite of the "Superstition" VM phrases, which begin way before the structural phrase.



6. "Mack The Knife" (Weill-Brecht; REC: Louis Armstrong; Bobby Darin's cover of Armstrong's arrangement)

Meter: **Combined quadruple**
Tempo: **Lively** (172 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Verse**
Wundt curve: **Left side/unity:** 3 consecutive iterations of the first VM phrase. The third iteration is in the same metrical position as the first, within their respective structural phrases. **Right side/variety:** In the Louis Armstrong (Bobby Darin) arrangement, the fourth VM phrase ("B") is both shorter (3 notes instead of 4) and has a different melody. All 4 VM phrases have different words.



7. "When A Man Loves A Woman" (Lewis-Wright; REC: Percy Sledge)

Meter: **Compound quadruple**

Tempo: **Slow** (64 BPM)

Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)

Song part: **Verse**

Wundt curve: **Left side/unity:** The musical elements of all 3 VM phrases, "A", "B", and "C", repeat exactly in the second structural phrase. **Right side/variety:** The words are different for all 6 VM phrases. The song is in compound quadruple meter, and the tempo is slow—characteristics that set this song apart from all the moderate-tempo songs in simple quadruple meter.

							A
(A)		B		C			A
(A)		B		C			A

8. "Going Back To Harlan" (Anna McGarrigle; REC: Emmylou Harris)

Meter: **Simple quadruple**

Tempo: **Lively** (166 BPM)

Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)

Song part: **Chorus**

Wundt curve: **Left side/unity:** The words "I'm going back to Harlan" repeat with the same melody and melodic rhythm. **Right side/variety:** No variety in this 8-bar period! An unusual case, as most 8-bar periods do have some internal variety, if only in the lyrics. In this song, the variety is in the *other* periods, and in the musical and lyrical contrasts between verses and choruses. This is one song you need to listen to from the top to appreciate how ace songwriter Anna McGarrigle deftly balances unity and variety.

			A	
(A)			A	
(A)			A	starts again

"A WOMAN WITHOUT … "

Many years ago, the *Dodge City Musical Saw Weekly* sponsored a song contest. To enter, you had to write a song beginning with the words, *A woman without*. Both Ms Puma and Marshal McDillon entered the contest. By sheer coincidence they both came up with the same opening line:

A woman without her man is nothing

But the VM phrasing of the two entries was different. Marshal McDillon's went like this:

			A
woman	*without her*	*man*	*is*
nothing			

Ms Puma's went like this:

			A
woman:	*with*	*-out her,*	*man is*
nothing			

The two versions of that line became well-known in Dodge, then spread to Wichita, then Kansas City, and eventually around the world.

The judges of the contest, Doc Yada-Yadams and an admiring reporter from the *Dodge City Musical Saw Weekly*, passed on both songs and instead selected a country-rap tune by Deputy Fester as the winner:

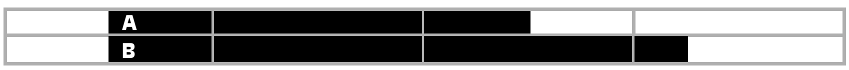
> "A Woman Without A Deputy Marshal Don't Know What She's A-missin', Hint, Hint, Sadie And Ellie Sue, Either One Of You Will Do"

9. "You Make Me Feel Like A Natural Woman" (King-Goffin; REC: Aretha Franklin)

Meter: **Combined triple**
Tempo: **Moderate** (112 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Chorus**
Wundt curve: **Left side/unity:** 3 consecutive exact iterations of the first VM phrase, both musically and lyrically ("You make me feel"). **Right side/variety:** The "B" VM phrase begins without a rest after the end of the third "You make me feel," which is unexpected, given the intervals following the first 2 iterations of the "A" VM phrase. The "B" VM phrase contrasts both lyrically and musically from the "A" VM phrase. "B" is almost twice as long and has a different melody. This song and Hank Williams, Sr.'s recording of "I'm So Lonesome I Could Cry" share both meter (combined triple, which is unusual) and tempo (112 BPM). Play them back to back for a study in similarity and contrast.

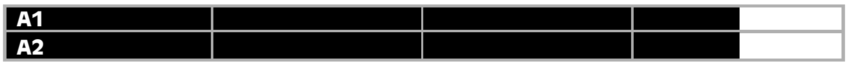
10. "Be My Yoko Ono" (Page-Robertson; REC: Barenaked Ladies)

Meter: **Simple quadruple**
Tempo: **Fast** (236 BPM)
Vocal starts: **After** beat 1 of bar 1 of the structural phrase
Song part: **Chorus**
Wundt curve: **Left side/unity:** Not much, except that the "A" and "B" phrases start at the same point within their respective structural phrases. This is the opposite of"Going Back to Harlan" (all unity, no variety). Like "Harlan," you need to listen to this song from the top to appreciate the unifying elements. For example, the title phrase "be my Yoko Ono" repeats 9 times. **Right side/variety:** In this period, the 2 VM phrases contrast, both musically and lyrically. The tempo of this song is flying, about double the "default" tempo range. Speed like that gets a song noticed.



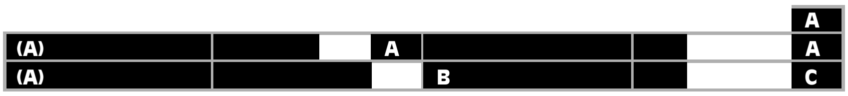
11. "Over the Rainbow" (Arlen-Harburg; REC: Judy Garland)

Meter: **Simple quadruple**
Tempo: **Slow** (88 BPM)
Vocal starts: **On** beat 1 of bar 1 of the structural phrase (or *after* in some recordings)
Song part: **Verse**
Wundt curve: **Left side/unity:** The second VM phrase, "A2" is a musical sequence: it repeats the melody of the first phrase, but at a lower pitch. The melody of the third bar of "A1" echos that of the first bar, but at a lower pitch. The melody of the second and third bars of "A2" form a sequence. **Right side/variety:** "A1" and "A2" do not form a "perfect" sequence. The third bar of "A2" does not follow the third bar of "A1" sequentially. Also, the lyrics of "A1" differ from the lyrics of "A2".



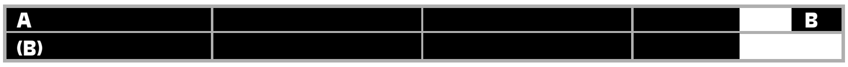
12. "Folsom Prison Blues" (Johnny Cash)

Meter: **Simple quadruple**
Tempo: **Fast** (222 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Verse**
Wundt curve: **Left side/unity:** 3 consecutive iterations of the "A" VM phrase. The first and third have the same metrical positions within their respective structural phrases. **Right side/variety:** The "B" VM phrase contrasts melodically with the "A" VM phrase. Also, all of the lyric lines are different.



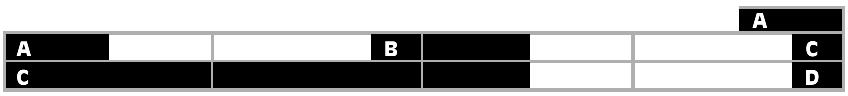
13. "Loser" (Hansen-Stephenson; REC: Beck)

Meter: **Simple quadruple**
Tempo: **Lively** (170 BPM)
Vocal starts: **On** beat 1 of bar 1 of the structural phrase
Song part: **Chorus**
Wundt curve: **Left side/unity:** Not much within this 8-bar period—just the slide guitar riff (ostinato) that repeats every 2 bars behind the vocal. However, this entire 8-bar period repeats immediately without variation each time it appears. It repeats a total of 8 times in the song. Although 2 VM phrases occupy more than 7 of the 8 bars of the period, VM phrase "A" has only 6 notes. "B" has 12. Two notes in each phrase are held for multiple beats. The lyric has only 13 words (3 in Spanish, 10 in English). **Right side/variety:** VM phrases "A" and "B" contrast both musically and lyrically.



14. "For The Good Times" (Kris Kristofferson)

Meter: **Simple quadruple**
Tempo: **Slow** (88 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Chorus**
Wundt curve: **Left side/unity:** Like "Loser," the VM phrases in "For The Good Times" do not repeat either musically or lyrically. But, of course, the entire period repeats several times during the song. Because of the slow tempo, it takes more than 20 seconds to hear the 15 words of the lyric in this 8-bar period—about 5 times slower than ordinary conversation. That's a lot of time for the listener's mind to process the semantic and emotional content of the lyric. **Right side/variety:** The 3 VM phrases are all different from each other, musically and lyrically. Also, the tempo is considerably slower than default tempo, which attracts attention.



15. "Come Fly With Me" (Van Heusen-Cahn; REC: Frank Sinatra)

Meter: **Combined quadruple**
Tempo: **Moderate** (136 BPM)
Vocal starts: **Before** beat 1 of bar 1 of the structural phrase (anacrusis)
Song part: **Verse**
Wundt curve: **Left side/unity:** As with the previous 2 examples, there's little unity within this period, save that the melody of the first part of melodic phrase "B" repeats the first part of "A," sequence-style—although the 2 VM phrases do not form a sequence. However, the third structural phrase (not shown below), repeats VM phrase "A" lyrically (with only slight variation), and also musically, sequence-style. **Right side/variety:** VM phrases "A" and "B" contrast both musically and lyrically.

16. "Into The Mystic" (Van Morrison)

Meter: **Simple quadruple**
Tempo: **Lively** (168 BPM)
Vocal starts: **After** beat 1 of bar 1 of the structural phrase
Song part: **Verse**
Wundt curve: **Left side/unity:** Melodically and rhythmically, the 2 iterations of VM phrase "A" are identical within the 2 structural phrases. **Right side/variety:** The lyrics of the 2 phrases are different from each other.

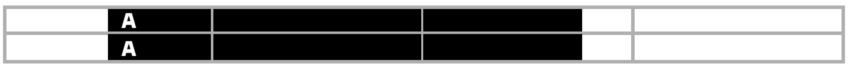


Table 68 below presents summary information on the above 16 examples.

TABLE 68 Summary Info on VM phrases Contained in 16 Eight- Bar Musical Periods from 16 *Gold Standard* Songs

How often does a VM phrase begin *before*, *on*, or *after* beat 1 of bar 1 of the first structural phrase?	• Before: 55% • On: 20% • After: 25%
How much of a 4-bar structural phrase contains VM phrasing? How much is "rest"—non-vocal intervals before, between, and/or after VM phrases?	• VM phrase 65% (range: 40-90%) • Non-vocal intervals 35% (range: 10-60%)
How many VM phrases are contained in an average 8-bar period?	• 2 VM phrases, about half the time (1 in each four-bar structural phrase) • 4 VM phrases, about half the time (2 in each structural phrase) • Only occasionally is the number of VM phrases not 2 or 4
How many note-syllables are in an average VM phrase?	• 7, on average (only about *5 words*) • Range: 3 to 12, rarely more (maximum of 9 or 10 words)
Within 1 period, how likely is it that a VM phrase will repeat, melodically?	• 60%,likelihood the VM phrase will repeat usually with different words in the second half of the period. • 40% of the time, there's no repetition within the period, but the whole period usually repeats immediately.

9.5.4 DO THE MELODIC TECHNIQUES PRESENTED IN THE NEXT 10 SECTIONS *GUARANTEE* EMOTIONALLY POWERFUL TUNES?

Guarantee? Not the way Sadie and Ellie Sue guarantee each horse they sell for five years or 50,000 miles, the best dang guarantee anywhere west of Wichita and north of Amarillo. Get on down to the Dodge City Horse Store before Thursday, make a deal, and they'll extend their guarantee to 6 years or 60,000 miles. Can't beat it with a hickory switch.

Not that kind of guarantee.

However, you will find the techniques you are about to learn in evidence in the best work of the greatest, most consistent composers of popular songs: Gershwin, Porter, Rodgers, Kern, Simon, Lennon-McCartney, Dylan, Waits, Hank Sr., Young, Bowie, Mitchell. All of 'em. And in the works of composers such as Bach, Mozart, Beethoven, Schubert, and the rest. Regardless of genre, the following techniques and principles of effective melodic composition *work*. If you learn them and use them, the odds that you will actually produce great tunes, and do it *consistently*, improve dramatically.

This is not about learning art. It's about learning *technique*. For practical purposes, think of the relationship between art and technique like this:

Art: Emotional communication via imaginative use of media such as vocal or instrumental sound, body movement, paint on canvas, film projection, etc.

Technique: Manipulative skill with the media used in creating art.

As a songwriting artist, you are forever manipulating elements such as melodic and rhythmic components, chord progressions, and various aspects of lyrics, such as rhyme and parallel construction. The more technical skill you have with musical and lyrical elements, the more successful you will be in translating what you *imagine* and *feel* into successful real-world art.

You have to master *technique* before you can expect to hit artistic heights:

> People make a mistake who think that my art has come easily to me. Nobody has devoted so much time and thought to composition as I. There is not a famous master whose music I have not studied over and over.
>
> —WOLFGANG AMADEUS MOZART

You first need to learn how the following techniques work, then become so familiar with them that they get lodged in your skull, in your long-term procedural memory. Like working with circular harmonic scales and other useful techniques covered in Chapters 6, 7, and 8. After a while, you will automatically incorporate them into your songwriting.

If you don't apply the techniques presented in the next ten sections, you will almost certainly *not* create memorable, convincing melodies. Or only rarely, just by chance—like the great majority of songwriters who, when it comes to composing a tune, have no idea what they're doing.

9.6 10 Techniques for Creating Emotionally Powerful Tunes (#1): Don't Let Your Comfort Zone Select Certain Song Elements

9.6.1 Why Pre-selecting Some Elements Works Better Than Letting Your Comfort Zone Select Them

First, your tune needs to be accessible enough to capture an audience's attention. In measured music, every melody has identifiable metrical characteristics and modal characteristics. That is, every melodic phrase unfolds in time within a milieu of meter, tempo, start point (with respect to a structural phrase), and melodic mode or scale type.

If you write songs randomly, by simply banging away at a guitar or keyboard, letting the metrical and modal characteristics take whatever shape they take, you will find yourself defaulting to a narrow range of metrical and modal characteristics that *you* find easy to work in, or that *you're* comfortable with—but that listeners find tedious or muddled. Your personal, boring, confusing comfort zone.

And you will probably compose mediocre tunes that all sound similar, structurally and melodically.

What's the alternative?

As guest lecturer Igor Stravinsky remarked at the beginning of Chapter 5, art is *organized* chaos. So get organized, already.

9.6.2 THE FOUR PRE-SELECTIONS

Before you even begin to dream up a tune, make the following four pre-selections. If you incorporate this practice into your songwriting routine, you will keep yourself out of the metrical-modal rut that most songwriters wallow in.

1. Pre-select Meter

In measured music, a melody is an irregular rhythmic entity that you *can't separate from meter*. So, since there's no melody without meter, pre-select a meter before you start composing a tune.

You have seven options:

1. Simple quadruple (the default)
2. Simple triple
3. Compound quadruple
4. Compound triple
5. Combined quadruple
6. Combined triple
7. Irregular

2. Pre-select Tempo

Every song proceeds at a certain tempo. So pre-select a specific tempo. Use a metronome and settle on a BPM number. (You can always change it later.) You have four tempo ranges to choose from (see Section 7.7.3).

1. Slow (60 ± 30 BPM)
2. Moderate (120 ± 30 BPM) Default range is 110 to 140 BPM
3. Lively (180 ± 30 BPM)
4. Fast (240 ± 30 BPM)

3. Pre-select VM Phrase Start Point with Respect to the First Structural Phrase

Since a VM phrase must proceed within a framework of structural phrases, pre-select one of the alternatives for starting a VM phrase with respect to beat one of bar one of a structural phrase. Choice of start point is just as important as choice of meter and tempo. A melody is a *rhythmic* entity, so each type of start point has a different effect on how the melody will ultimately sound (see Section 8.2.5).

You have three choices.

1. *Before* beat one of bar one (anacrusis, the default)
2. *On* beat one of bar one
3. *After* beat one of bar one

If you select either "before" or "after," you don't need to decide exactly how many beats before or after, prior to writing a tune. Just "before" or "after" will do.

4. Pre-select Mode or Scale Type

A melody is comprised of a coherent succession of notes that belongs to a group of related tones called scales. Think of scales as belonging to three broad categories. Pre-select one category to work with:

1. Major mode—any major diatonic scale (the default)
2. Minor mode—any minor diatonic scale
3. Some other scale type, such as major or minor pentatonic, blues, or Church-mode (e. g., the Dorian scale)

You *don't* need to decide on a specific scale. Just decide whether you're going to work in a major key, or a minor key, or some other alternative, such as a Church mode.

9.6.3 AIM FOR VARIETY IN YOUR PRE-SELECTION COMBINATIONS

In making your four pre-selections, *try to avoid the defaults in two or three of them.* Or at least select a combination you've never used in a previous original song.

You won't run out of combinations to pre-select from. Not any time soon. If you multiply out all the choices in the above four characteristics—seven meters, four tempo ranges, three start points, three mode/scale categories—you get 252 possible combinations. You could write a song every week with a different pre-selection combination for almost five years before you'd start repeating them.

If you already have a body of original songs, go through each one and make a note of the combination of "pre-selection" characteristics for each song (even though you did not pre-select them). See how many of your own songs have "default," characteristics. And how many use the same combination of four characteristics, or have three out of four characteristics in common.

9.6.4
SKETCH YOUR FOUR PRE-SELECTIONS ON PAPER

Once you've made your four pre-selections, draw a little sketch of an eight-bar period—two four-bar structural phrases—on paper (the back of an envelope, so that when you write your first immortal song, you can claim that you scribbled it on the back of an envelope), noting your four pre-selections. Mark the approximate VM phrase start point with an "X." Something like this:

Combined quadruple, 100 BPM, after beat one, major key,

X			

Now that you've made your four pre-selections, you'll probably feel comfortable enough to try creating your own tune(s).

But don't do it yet. Instead, go through the next nine techniques, then try the approach to songwriting that follows technique #10.

SARTWELL'S LAWS

Prof. Crispin Sartwell's laws come in handy if you're interested in evaluating the quality of a rock band. Maybe *your own* band ...

Sartwell's First Law: The quality of a rock band is inversely proportional to its pretentiousness. The pretentiousness of a rock band can be expressed as the ratio of its artistic ambition to its artistic accomplishment.

Sartwell's Second Law: The quality of a rock song varies inversely as the square of its distance from the blues. The bluesier the better.

Application of Sartwell's Laws leads to the conclusion that, as a rock band, The Rolling Stones beat The Beatles. The evidence:

- Beginning with *Revolver*, The Beatles' artistic ambition outweighed the band's artistic accomplishment. Moreover, The Beatles, once a great R & B band, strayed far from the blues tradition.

- The Rolling Stones never aspired to be anything more than a blues-rock band. They did not let artistic ambition get ahead of artistic accomplishment. Further, in all their years of playing, they rarely strayed far from the blues.

According to Sartwell, the application of his two laws yields a short list of the worst rock acts in history: King Crimson, Pearl Jam, Emerson, Lake & Palmer, early U2, and early Bruce Springsteen.

9.7 10 Techniques for Creating Emotionally Powerful Tunes (#2): Recognize the Primacy of Rhythm Patterns

A melodic phrase has two components: a tune and a rhythm pattern. How important is the rhythm pattern to melodic unity?

Suppose you play a melodic phrase, and then have a choice of playing it a second time either with changes to the rhythm pattern or with changes to the melody.

- If you were to play the same melody with a totally different rhythm pattern, listeners would have a hard time recognizing the second melodic phrase as being related to the first. A major coherence problem.

- If you were to retain the same rhythm pattern but change the melody, listeners would easily recognize the second melodic phrase as being related to the first, preserving coherence.

> **The *rhythmic* aspect of a VM phrase (or a melodic phrase) plays a central role in creating melodic identity and coherence.**

So, when you're working on your own tunes, make an effort to craft unique rhythm patterns. They don't have to be complex, but they need to contrast with the metrical regularity of the underlying structural phrase in order get noticed and make the melody interesting.

Review the rhythm patterns of the VM phrases in the 16 examples in Section 9.5.3. Keep in mind that the starting point of the rhythm pattern with respect to the structural phrase helps determine the character or identity of the rhythm pattern (Section 8.2.5).

THE SONG TAPPER

If you become obsessed with rhythm patterns, you can visit a therapeutic website called The Song Tapper. Like thousands of others every day, you too can go nuts tapping rhythm patterns of popular songs on the space bar of your computer keyboard, just to see what titles come up.

Here's the URL: www.SongTapper.com.

9.8
10 Techniques for Creating Emotionally Powerful Tunes (#3): Use Sequences

> *Ilsa:* Play it once, Sam, for old times' sake.
> *Sam:* I don't know what you mean, Miss Ilsa.
> *Ilsa:* Play it, Sam. Play "As Time Goes By."
> —JULIUS EPSTEIN, PHILIP EPSTEIN, & HOWARD KOCH (*Casablanca*)

If two consecutive ML phrases have the same rhythm pattern, the second is usually related to the first in one of the following six ways:

1. Same melody with the same lyrics
2. Same melody with different lyrics
3. Same melody repeated at a different pitch, with the same lyrics
4. Same melody repeated at a different pitch, with different lyrics
5. Different melody with the same lyrics
6. Different melody with the different lyrics

Humans have inborn sequence recognition. Infants can recognize the same tune played at a different pitch (i.e., the whole melody or phrase, raised or lowered in pitch).

Options 1 and 2 in the above list are common in songwriting, but not as interesting as the other four alternatives. This section discusses options 3 and 4. Section 9.9 deals with 5 and 6.

A *sequence* is a melodic phrase that is repeated at a different pitch. Sequences are exceedingly effective in melody building, although in popular music, you don't hear sequences as much as simple bald melodic repetition (1 and 2 above). Like modulation and many of the other 10 techniques in this chapter, the sequence is highly effective but under-exploited because most songwriters don't know what it is or how it works.

- Sequences provide a strong sense of melodic coherence or unity because a whole group of tones— *a pattern or melodic unit*—is repeated. A sequence is a melodic *chunk*, instead of a random group of notes.

- Sequences also provide variety because the repetition happens *at a different pitch.*

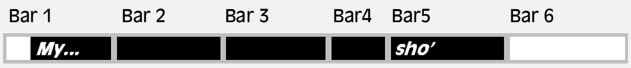
One of the beauties of the sequence is that you can use the merest motive of three or four notes and construct an entire verse, chorus, or whole song out of it. This is an ideal to strive for: *maximum melodic milage from the fewest possible notes*. Unity is assured and, if you apply certain techniques, so is variety. For instance, you can:

- Build leaps into the motive or phrase, ensuring repetition of the leaps at different pitches (technique #5, coming up)
- Build in augmentation and diminution, ensuring their repetition at a different pitch (technique #6)
- Position the motives or phrases metrically so that non-chord tones get metrical position accents, which then get repeated at a different pitch (technique #8)
- If the sequences move upwards in pitch, take the melody to a satisfying climax (technique #10)

Table 69 lists a few examples of songs with sequences:

TABLE 69 A Smattering of Great Songs with Sequences

Song	Sequences
"As Time Goes By" (Hupfeld)	You must remember this A kiss is just a kiss A sigh is just a sigh
"Settin' The Woods On Fire" (Rose-Nelson)	Comb your hair and paint and powder You act proud and I'll act prouder You sing loud and I'll sing louder

"Hey Ya" (Outkast)	The first "hey ya" and the second "hey ya" of the chorus form a semi-sequence. "Hey" is the same pitch in both instances, but "ya" is different. This song is comprised of 6-bar structural phrases, the fourth bar of which has 2 beats instead of 4. Here's how the 2 VM phrases of the chorus fit the structural phrase:  This unusual structural phrase gives the song a unique sound, much different from regular 4-bar phrases with 4 beats to the bar. Repetition of the oddball structural phrase throughout the song, unaltered in both verses and choruses, provides unity. Differing somewhat from the above VM phrases of the chorus is the single VM phrase of the verses, contributing additional variety: 
"El Paso" (Marty Robbins}	*Out in the west Tex-* *town of El Paso* *I fell in love with*
"On Broadway" (Leiber-Stoller-Mann-Weil)	*They say there's always magic* *But when you're walking down that*
"Satisfaction" (Jagger-Richards)	*I can't get no* and *satisfaction* form a sequence at verse beginnings **Also:** *cause I try ... and I try ... and I try ... and I try*
"The Girl From Ipanema" (Jobim-De Moraes-Gimbel)	*when she passes, each* *One she passes goes* **Also:** *Oh but I watch her so sadly* *How can I tell her I love her* *Yes, I would give my heart gladly* **Also:** *But each day when she walks to the sea* *She looks straight ahead, not at me*
"Across The Universe" (Lennon-McCartney)	*rain into a paper cup, they* *slither while they pass, they slip* **Also:** *Jai Gu-* and *-ru De-* **Also:** *Nothing's gonna change my world* *Nothing's gonna change my world*
"Get Back" (Lennon-McCartney)	*Jo Jo was a man* (the rest of this line varies from the next two lines) *Thought he was a loner* *But he knew it couldn't*

"Eleanor Rigby" (Lennon-McCartney)	*rice in the* *church where a* *wedding has* Lots of Lennon-McCartney tunes have prominent sequences: "Penny Lane" (beginning of verse), "Maxwell's Silver Hammer" (chorus) , "Norwegian Wood" ("Isn't it good ... Norwegian wood"), "You Never Give Me Your Money," to name a few.

To avoid monotony, it's wise to limit the number of motives or phrases in a sequence to two or three, as in the examples above. Sometimes three pushes the limit. If more, you need to alter the tune to keep if from getting too predictable.

9.9
10 Techniques for Creating Emotionally Powerful Tunes (#4): Use the Same Rhythm Pattern with Multiple Melodies

Speaking of altering the tune, melodic rhythm patterns are so memorable that if you repeat the rhythm pattern but completely alter the tune, the listener will perceive charming variety within unity. This is one of the most potent and under-exploited techniques you can use in creating a tune for a song.

Table 70 lists a few examples from the *Gold Standard Song List*.

TABLE 70 Rhythm Patterns that Don't Change and Melodies that Do: A Few GSSL Examples

Song	VM Phrases with Same Rhythm Pattern, Different Melodies
"I Got Rhythm" (Gershwin-Gershwin)	*I got rhythm* *I got music* This song repeats the same rhythm pattern in the middle eight, with new melodies: *Ol' man trouble* *I don't mind him* *You won't find him* *Round my door*
"Early Morning Rain" (Lightfoot)	You can work many different melodic phrases into a song if you preserve the identical rhythm pattern. This song has six unique short melodies that share the same rhythm pattern: *In the early mornin' rain* *with a dollar in my hand* *with an achin' in my heart* *and my pockets full of sand* *I'm a long way from home* *and I miss my loved ones so* There are two more lines (7 & 8) that are melodic repetitions of the first two lines.
"Heart Of Gold" (Young)	I wanna live I wanna give
"Strawberry Fields Forever" (Lennon-McCartney)	*Let me take you down* *Cause I'm going to* (This pair borders on being a sequence)
"A Day In The Life" (Lennon-McCartney)	*I read the news today, oh boy* *About a lucky man who made*
"Born To Lose" (Brown-Daffan)	*Born to lose, I've lived my life in vain* *Every dream has only brought me pain* *All my life, I've always been so blue* *Born to lose, and now I'm losing you* (With an attitude like that, who wouldn't leave this person?)
"Mercedes Benz" (Joplin-Neuwirth-McClure)	*Oh Lord, won't you buy me a Mercedes Benz?* *My friends all drive Porches; I must make amends* *Worked hard all my lifetime, no help from my friends*
"Is That All There Is?" (Leiber-Stoller)	*Is that all there is?* *Is that all there is?*

9.10
10 Techniques for Creating Emotionally Powerful Tunes (#5): Mix Up Steps, Leaps, and Repeats

Once a melody gets going, it can move pitchwise in one of three ways:

1. ***Stepwise (Conjunct) Motion.*** As you know, a step is a melodic interval of a major or minor second (one or two semitones), either up or down. When melody moves by intervals of a step, it's called *stepwise motion* or *conjunct motion.*

2. ***Leapwise or Skipwise (Disjunct) Motion.*** Melodic motion by any interval larger than two semitones, either up or down, is variously called *leapwise motion* or *motion by leap* or *motion by skip* or *skipwise motion* or *disjunct motion.* Take your pick.

3. ***Repeated Tone Motion.*** When a tone simply repeats, even if the next tone is of a different duration, it's called *repeated tone motion*.

9.10.1
STEPWISE (CONJUNCT) MOTION

Listeners *expect* a melody to move mainly by steps. Stepwise motion creates melodic cohesion. This is the Gestalt principle of proximity: listeners recognize patterns or threads in sequences of tones that are *close together in pitch*.

Listeners perceive melodic motion by step as easy and flowing, which is why it's called *conjunct* motion.

But if conjunct motion goes on for too many steps, it gets monotonous because it becomes too predictable. How many consecutive steps are too many? Four or more *in the same direction* start to sound like someone practising scale exercises.

As discussed at the outset of this chapter, the pleasure you get from music relates to the emotion that comes of foiling the brain's prediction machinery (surprise!). There are a couple of ways you can mess with your audience's foretelling faculty and make stepwise motion interesting, without sacrificing melodic coherence:

- Don't use tones of the same duration (technique #6, coming up).
- Ensure that some steps include non-chord tones in metrically accented positions (technique #8, coming up).

9.10.2 LEAPWISE (DISJUNCT) MOTION

Leapwise (or skipwise) motion refers to motion in intervals of three or more semitones up or down *within* a VM phrase, not between VM phrases.

Although leapwise motion is usually termed *disjunct*, it can sound decidedly conjunct when the melody moves in thirds, using the same tones as the accompanying triads or seventh chords. "The Star Spangled Banner" begins with a sequence of downward and upward leaps. But those leaps (the tones that go with the words, *O - oh say can you see*) are mostly thirds that simply follow the chord tones in succession. This is called an *arpeggio.* Because the tones of the melody do not deviate from the tones of the prevailing chord progression, there's no sense of disjunction, no loss of melodic cohesion.

After the initial leap-filled eight-bar period, which repeats, the remainder of "The Star Spangled Banner" is comprised mainly of steps, with only a few leaps and a few repeated tones.

Leaps wider than a third are perceived as *disjunct*. They're dramatic—especially leaps *upward*—because they're unexpected, and unmistakably wider than steps. They create pitch accents. The more leaps, the more excitement.

But, as with steps, there are several ways you can spoil a melody with leaps if you aren't wary:

- Too many consecutive leaps, up and down and up and down, can sound clumsy, disjointed, and incoherent, unless handled carefully (e.g., the verse of "Street Fighting Man," comprised of numerous repetitions of the same perfect-fourth leap, which keeps the tune unified).
- Too many leaps in the same direction can render a tune unsingable if the pitch range becomes too wide.
- A leap to or from a chromatic note may weaken tonality. This does not apply if you're using the modal technique, because all Church mode scales have some chromatic notes. (technique #9, coming up).

Here are four guidelines to keep in mind when you're working on a tune with leaps:

1. Use some leaps—but not too many. Enough to give your melody some drive and energy. But keep in mind that if your tune does not have significantly more steps than leaps, it will usually fail to cohere in your listeners' brains.

2. A leap carries greater melodic weight if it's accompanied by a chord change because the second note of the leap gets a multiple accent:

   - The harmony changes at the same moment the melody makes a significant change.

   - A chord change usually occurs on a metrically accented beat (metrical position accent)

   - The second note of a large leap is usually of longer-than-average duration (agogic accent; technique #6, coming right up)

3. Leaps of thirds, fourths, fifths, and octaves are safe, compared with leaps of sixths, sevenths, and ninths, which elicit stronger emotion, but pose a risk of sounding awkward if not used with a bit of care.

4. After a leap, especially a *large* leap, it's usually wise, for the sake of melodic cohesion, to"fill in" the pitch gap, mainly with stepwise motion. Filling-in need not proceed immediately after the leap. It can move in waves that gradually fill in. For example, "Over The Rainbow" begins with a dramatic octave leap. By the end of the second measure, the top half of the octave leap is filled in with stepwise motion. But it's not until the second phrase, second measure, that the bottom half of the leap gets filled in.

   In "Over The Rainbow," the stepwise filling-in proceeds mainly *upwards* in pitch, on the words *-ver the rainbow* and *that I heard of*. If you reverse these two phrases and sing *that I heard of*, followed immediately by *-ver the rainbow*, you have the complete octave leap filled in stepwise—it's the diatonic major scale: do-re-mi-fa-so-la-ti-do.

   You can also fill in an upward leap by moving stepwise downwards. Think of ascending and descending a staircase. You can easily *leap* upwards, several steps at a time. But coming back down, it's prudent to *step* downwards, one step at a time, or you and your horse will break your necks.

   If a leap is small—a leap between chord tones of a triad or seventh chord—then filling in the pitch space after the leap is not necessary for melodic coherence, or at least not as urgent.

9.10.3 REPEATED TONE MOTION

Recall from Chapter 3 that pitch is about the "height" of sound. It's the *vertical* dimension of music, although it also has a horizontal dimension because it consists of intervals in temporal succession.

Melody is less interesting when successions of intervals do not vary in pitch. Repeated tones are inherently *non-melodic.* Too many repeated tones tend to retard melodic development. Melody is much more interesting and emotionally compelling when the tune keeps changing direction. The listener's brain has a harder time predicting the next note or series of notes. It's the element of surprise. And surprise elicits emotion.

Most great songs have a small proportion of repeated tones. They usually occur in twos or threes, with alternate tones on metrically weak beats, so that the repetition is not as perceptible. Or they occur in larger groups in fast-tempo songs, which have a high total number of notes, and can handle more repeated tones.

A melody that has a high *overall proportion* of repeated tones quickly becomes boring and forgettable. When successive notes don't change pitch, there's no tension to resolve. Most songwriters, who have no idea how important it is to keep a melody moving, unwittingly shackle melodies with many noticeable groups of four, five, or more repeated tones, preventing the melody from taking flight.

> **In a popular song, VM phrases tend to be short, and the melodies are repeated often, even if the lyrics change. So wasting valuable VM phrase time on a lot of repeated tones has the effect of *repeating* repeated tones, practically guaranteeing melodic monotony.**

Inserting more chord changes to make a dull melody interesting does not work as well as changing the direction of the melody. The brain tracks melody more keenly than harmony. Recall from Chapter 6 that melody-free harmony does not stand on its own, but harmony-free melody does (if well-composed). Unlike melody, chords have no inherent upward or downward quality.

When to Make a Point of Using Repeated Tones

Perils of repeated tone motion notwithstanding, you can make deliberate, effective use of repeated tones in several ways:

1. ***If you want to focus the listener's attention on the words and rhythm, not the tune,*** use a lot of repeated tones. All rappers do this, of course. Some great non-rap songs have significant passages of repeated tones, such as U2's "One," "Miss

Otis Regrets," and "One Note Samba." Some songwriters who are famous for the quality of their lyrics have used this technique conspicuously:

- Bob Dylan: "Subterranean Homesick Blues," "The Times, They Are A-changin'," "It's All Over Now, Baby Blue," "Political World"

- Leonard Cohen: "The Future," "Closing Time," "First We Take Manhattan," "Teachers"

2. ***Groups of repeated tones can work well if sequenced.*** By repeating a whole group of repeated tones *at a different pitch*, you effectively chunk the group. Some examples:

   - Lennon-McCartney's "Get Back" (verse); "Golden Slumbers" (the repeated line, *Once there was a way*); many other Beatles tunes with sequenced repeated tones

   - Most of the first two VM phrases of the verse of "Born To Be Wild": *Get your motor running* and *Get out on the highway* form a sequence, with each phrase comprised mainly of repeated tones

   - The first three VM phrases of the verse of "Settin' The Woods On Fire" (see Table 69)

3. ***Repeated tones sound exciting if the notes are short and fast.***

   - Bo Diddley's "Who Do You Love?" (verses)

   - Lennon-McCartney's"Help!" (verses)

   - Hank Snow's "I'm Movin' On"—the first 20 or so notes of each verse

9.10.4 MIXING MELODIC MOTION

To improve your odds of creating a great tune, make a point of:

- Using mostly stepwise motion, but make it interesting, using the techniques discussed in this section.

- Including some leaps beyond thirds.

- Refraining from using any more than a minimal proportion of repeated tones (remembering that the faster the tempo, the more repeated tones your tune can absorb without getting monotonous), except when you deliberately want to downplay the tune to focus attention on lyrics, or when groups of repeated tones form sequences, or when the tempo is fast and notes short.

9.11
10 Techniques for Creating Emotionally Powerful Tunes (#6): Mix Up Note Values

9.11.1
THE LONG AND SHORT OF IT

If all or most of the notes of a VM phrase are of the same value (duration), the notes tend to match the underlying beat in lock step, which can sound rigid and boring. Once again, not enough variety. Too predictable.

The solution, of course, is to mix up note values. The usual problem is that there are too many notes of short duration, hardly any of long duration. And if there are any long-duration notes, they invariably occur only at the ends of VM phrases.

Here are some ways you can use note values to create melodic interest:

- ***Start VM phrases on unaccented beats.*** Every so often, begin and end VM phrases on *offbeats, between* metrically accented beats. This disrupts the lock-step effect of consecutive equal-value notes.

- ***Begin a phrase with a long note.*** Another highly effective technique is to use a note of long duration at or near the *beginning* of a VM phrase, instead of the usual position at the end. Some examples: "Loser" by Beck (chorus); "I Still Haven't Found What I'm Looking For" by U2 (chorus); "Ooh Las Vegas" by Gram Parsons (chorus); "The Night They Drove Old Dixie Down," by The Band (chorus); "Moon River" by Henry Mancini and Johnny Mercer;

"Smooth Operator" by Sade & R. St. John (chorus—the second "smooth" phrase in each pair); "Golden Slumbers" by Lennon-McCartney (chorus); "Take the 'A' Train" by Billy Strayhorn.

- ***Use leaps.*** Leaps are usually notes of *longer* duration. So if you include some leaps in your tunes, you usually ensure note-value variety. As for notes of short duration, they sound best if they proceed stepwise, or with the occasional small leap of a third or fourth. Short-duration notes that proceed mainly by leap tend to sound choppy and incoherent.

In highly active melodic passages (many short notes per bar), you can contribute to unity by restricting the frequency of chord changes. Conversely, in passages with few notes, but long ones, you can add variety by changing chords more often.

9.11.2 How Melodic Augmentation and Diminution Work

Augmentation refers to switching from short note values to long note values—usually double the previous note value. Which means the number of notes per bar suddenly decreases by half. Which makes music sound like it has suddenly slowed down.

Diminution is the opposite: switching from long notes to short notes (usually half the previous note value). Which means the number of notes per bar abruptly doubles. Which makes the music sound like it has suddenly sped up.

Both effects capture listener attention because they're unexpected.

In popular music, song parts tend to alternate frequently, so augmentation and diminution can be striking. For instance:

- In the Lennon-McCartney song, "Across the Universe," you hear the "slowing down" augmentation effect when the song goes into the *Jai Guru Deva* chorus, in which the notes are twice as long as the notes of the verse. When the chorus ends and the tune goes into the next verse, you hear the "speeding up" diminution effect, with the number of notes per bar suddenly doubling, compared with the chorus.

- The Patty Larkin song, "Who Holds Your Hand?" has the same verse-chorus diminution-augmentation effect as "Across the Universe," only more pronounced.

- Same with "Who Do You Love?"

- And the Queen song, "We Will Rock You."
- The Bee Gees disco anthem, "Stayin' Alive," has several passages of augmentation and diminution in the chorus.
- In The Drifters' recording of "Under The Boardwalk," you can hear the augmentation effect going into the chorus, followed by diminution.
- Diminution in the middle eight of "Over The Rainbow" provides a refreshing contrast to the long notes of the verses.

Like many other powerful techniques, this one is seldom used except by the few songwriters who know what they're doing.

9.12 10 Techniques for Creating Emotionally Powerful Tunes (#7): Use Modulation

You already know about modulation from Chapter 6 (Sections 6.12 to 6.14). In popular music, modulation's pretty rare (except the ubiquitous Truck Driver's Gear Change), so if you can do it successfully, your song will stand out.

When you modulate, you start out in one key, move to a different key (or keys) and then *return to the original key* (important!). You become a citizen who goes touring abroad, taking your audience with you. But you do not lose your citizenship just because you cross an international border.

If you modulate going into the chorus, you return in the next verse to the tonality you began with. But the words are different. You have taken your audience back home, but have landed at a different airport. Soon, you all go travelling abroad again, each time returning to a different part of your homeland.

When you successfully modulate, your listeners enjoy an adventure they seldom get in a popular song. Study some of the great modulating songs discussed so far, such as "I Got Plenty O' Nuttin'" and "Street Fighting Man" and "Georgia On My Mind" and "Orange Blossom Special." If you want to write truly great popular songs, you need to learn modulation (except shift modulation). It's not terribly difficult, and it can be extraordinarily effective and memorable.

9.13
10 Techniques for Creating Emotionally Powerful Tunes (#8): Use Non-chord (Non-harmonic) Tones on Accented Beats

9.13.1
WHY NON-CHORD (NON-HARMONIC) TONES ON ACCENTED BEATS LIGHT UP A TUNE

Suppose you're playing the chord C major, which is comprised of the notes C, E, and G. Suppose the tune you're singing only moves among those three notes (in any order). The melody is using *chord tones* only. This is called *consonant harmony.*

- Consonant harmony provides strong tonality and is often used at the beginning of a song for that reason—to establish tonality.
- The opening phrase of "The Star Spangled Banner" uses chord tones only.
- With consonant harmony, if you remove the chords altogether, you still get a sense of the harmony, and the tune easily stands on its own.

A *non-chord tone* (sometimes called a *non-harmonic tone*), as the name indicates, is a melodic note that does not belong to the prevailing chord. Suppose you continue to play the chord C major, C–E–G, but melody uses the notes C, D, E, and G. The note D is a non-chord tone. It belongs to the C major *scale*, but not to the C major *chord*.

If you were to introduce the note E♭ to the melody, still playing the chord C major, then E♭ would be a *chromatic non-chord tone.*

Non-chord tones create dissonance, which disturbs order, creates tension, requires resolution. The surprise of hearing the dissonance of a non-chord tone triggers an emotional reaction in the listener's brain.

If a non-chord tone occurs in an unstressed metrical position, such as the second or fourth beat of a typical 4/4 measure, the non-chord dissonance is barely noticed because of the unstressed position.

If the non-chord tone occurs on an accented beat, such as the first or third beat of a 4/4 measure, the dissonance sticks out. It gets noticed big time. Such stressed or accented non-chord tones often spell the difference between a great melody and a mediocre one.

Non-chord tones that occur on accented beats create disorder and cause conflict, setting up the inevitable resolution to consonance that restores order. The melody moves from consonant harmony to dissonant harmony, then back to consonant harmony. The melody becomes more memorable and distinct because there is so much emotional tension constantly arising, then being resolved.

A few points to keep in mind about using non-chord tones:

- ***Consonant chords*** work best with accented non-chord tones. Just simple majors and minors instead of dissonant chords. Suppose you're playing the dissonant chord C9th, which is comprised of the tones, C, E, G, B♭, and D. If the melody then moves to the note D, the dissonant effect is weakened substantially because the chord C9th already contains the note D. There's no surprise when the melody hits that note, even if on an accented beat.

- ***If a melody is syncopated, the metrical strong-weak effects are reversed or inverted.*** For example, if a VM phrase starts on the normally weak beat two, then a non-chord tone on beat two will stand out and have a strong dissonant effect.

- ***Non-chord tones make stepwise motion powerful while preserving melodic coherence.*** An ordinary major or minor or seventh chord consists of tones in intervals a third apart. So if the melody moves stepwise—in intervals of seconds—*it cannot help but create non-chord tones.* For example, if the prevailing chord is C major, C–E–G, and the melody moves stepwise, E – F – G – A – G, then the notes F and A are non-chord tones. But these two notes take on melodic significance only if they occur on strong metrical accents. Otherwise, they're hardly noticed.

A well-placed non-chord tone has such a strong effect because it defies the gravitational pull of the chordal mass. It creates a dissonance, a melodic sparkle or flash.

> **You will find metrically accented (strong) non-chord tones in the best melodies of Lennon-McCartney, George Gershwin, Cole Porter, Bob Dylan, Hank Williams, Neil Young, Joni Mitchell, Elton John, Van Morrison, and practically every other outstanding songwriter.**

9.13.2 TYPES OF NON-CHORD TONES

Of these main types of non-chord tones, the two types to actively recruit for your tunes are *accented neighboring tones* (also called *appoggiaturas*) and *suspensions*.

Unaccented Neighboring Tone—Auxiliary (Weak)

When the melody moves from consonance to dissonance to consonance by a semitone or tone and the dissonant note falls on a metrically weak beat, the neighboring tone is called an *auxiliary*. It's weak. Nearly all songs have auxiliaries.

Accented Neighboring Tone—Appoggiatura (Strong)

When the melody moves a semitone or a tone from consonance to *accented dissonance* to consonance, or a phrase begins with an accented dissonant note, then resolves to consonance, the dissonances are *accented neighboring tones*. These movements may be either upward or downward in pitch.

The first vocal note of the Lennon-McCartney song, "Yesterday," the syllable *yes*, is an accented (dissonant) neighboring tone—an *appoggiatura*—that moves down a tone to resolve to a consonance of the prevailing chord (*-terday*). The same thing happens on *far* (dissonant) and *away* (consonant); *here* (dissonant) *to stay* (consonant), etc. This song has many accented non-chord tones.

Another example plucked at random from the *Gold Standard Song List* ... the Talking Heads classic, "Once In A Lifetime." This time, the accented neighboring tone moves *up* to resolve to prevailing-chord consonance. The chorus begins with the tonic chord (D major) as the prevailing chord. This chord is comprised of scale degrees 1, 3, and 5. Melodically, the note on beat one of bar one is scale degree 2, a non-chord tone, on the word *days* (and, later in the chorus, the words *blue* and *life-*). This dissonance then resolves up to scale degree 3 on the word *go* (and, in the other lines, the words *again* and *-time*).

Passing Tone (Weak)

A passing tone is just a transitory (weak) dissonant note between a stressed consonant tone of one chord and a stressed consonant tone of the succeeding chord. Practically every tune, great and mediocre, has passing tones.

Suspension (Strong)

When you hold over a tone that belongs to one chord but not to the next chord in the progression, you have a suspension. The melodic note becomes an accented non-chord tone with respect to the new chord. It stays that way, in a "suspended"-sounding state, delaying resolution for a while, then "lets go" of the suspended state. It usually resolves by moving one or two semitones up or down to a tone of the new (prevailing) chord.

In the Preston-Fisher song, "You Are So Beautiful," the same melodic note, scale degree 3, prevails on *You are so beaut-*. The harmony on *You are so* is the tonic chord, which contains scale degrees 1, 3, and 5. So the harmony is consonant up to that point. Then, on the syllable *beaut-*, the chord changes to IV, comprised of scale degrees 1, 4, and 6. Since the melody stays on scale degree 3, the note becomes a *suspended non-chord tone*. The melody then steps down to scale degree 2 (weak accent), then scale degree 1 (strong accent), resolving the suspension on the syllable *-ful*.

For an example of a dissonant suspension that steps *up* to resolve to consonance, have a listen once more to the chorus of the same instructive Talking Heads song, "Once In A Lifetime." At the end of the first bar, the chord is about to change. The prevailing harmony is the tonic chord (D major), comprised of scale degrees 1, 3, and 5. The melodic note is scale degree 5 (on the words *let the*). So at this point, there's no dissonance. Then, at the beginning of the next bar, the chord changes to the IV chord (G major), comprised of scale degrees 1, 4, and 6. But the melody remains on scale degree 5, which is not a note of the IV chord. This creates suspension, an *accented non-chord tone* (the first beat of the IV-chord bar). On the next beat, the melody moves *up* to scale degree 6, which resolves the dissonance.

It would be worth your while to download "Once In A Lifetime" for a buck. Listen to that chorus for the accented neighboring tone *and* the suspension. Both recur in every line of the four-line chorus. Melodically, repeated use of these two types of non-chord tones is precisely what makes the chorus catchy and memorable.

One final example of a highly effective suspension: Lennon-McCartney's good ol' "Golden Slumbers," a tune that does everything right. At the outset of the chorus, the prevailing chord is the tonic, comprised of scale degrees 1, 3 and 5. The melodic tone, on the word *golden*, is scale degree 3, so there's no dissonance. Then, on the syllable *slumb-*, the chord changes to IV, comprised of scale degrees 1, 4, and 6, but the melody remains on scale degree 3, creating a suspension, a dissonant accented non-chord tone. The melody then moves to scale degree 6, resolving the dissonance by leaping down an interval of a fifth.

Anticipation (Weak)

An anticipation is the opposite of a suspension. A melodic note is already a non-chord tone, but when the chord changes, the dissonance is resolved. So the non-chord tone "anticipates" its harmonic resolution.

9.14 10 Techniques for Creating Emotionally Powerful Tunes (#9): Use Modal Scales with Diatonic Chords

9.14.1 HOW MODAL MELODY WORKS

Using Church mode scales with ordinary diatonic triads is yet another powerful but under-utilized technique for creating great melodies—under-utilized, again, simply because few songwriters have any awareness of it.

For reasons discussed in some detail in Chapter 6, Church mode harmony does not work. But Church mode *melody* against ordinary chords derived from the major and minor modes works well in creating interesting melodies that elicit emotional responses. The reason is that, if you pick a Church mode and stick with it melodically, but use regular major and minor chords for the progression, the tune will end up with *chromatic* tones. The scale of every Church mode contains one or more chromatic notes with respect to it's diatonic-scale counterpart.

For example...

- Suppose you construct a chord progression using the three principal chords in the key of D major (D, G, and A7). The notes that make up those chords are: D E F♯ G A B C♯ D.

- Now suppose you write a tune using *only* the *notes* of the Dorian mode. They are: D E F G A B C D (the white keys on a keyboard, beginning and ending with D).

- Two of the notes of the tune, F and C, will clash with the notes of the three principal chords. Those two notes are *chromatic*—they don't belong to the key of D major.

To preserve the Dorian mode feel, it's important to avoid any instances of the notes F♯and C♯in the melody.

Also, remember that any Church mode scale can use any of the 12 chromatic notes as the tonic note. For example, the Dorian mode scale can begin and end on the note E, provided you preserve the order of tones and semitones that defines the Dorian mode: tone, semitone, tone, tone, tone, semitone, tone. So if you start on the note E, the Dorian scale would be E F♯ G A B C♯ D E. And you'd play the chords of E major: E, A, and B7.

If you try this technique, whether with the Dorian or any other Church mode, be careful not to over-use chromatic notes in your melody, or you could undermine all-important tonality. You may wish to study the songs with modal melodies listed in Section 5.2.4.

9.14.2 USING PARALLEL KEYS SIMULTANEOUSLY

If you use parallel keys simultaneously—the *scale* of the minor key for melody and the *chords* of the major key for harmony—you're actually using the modal technique described above. You're using the *Aeolian mode*, which is now called the minor mode, with major chords. For instance, you could use the scale of A minor (A B C D E F G A) with the chords of A major (A, D, E7). Or the scale of C♯minor with the chords of C♯ major.

Section 6.13.10 provides an example of this technique, which is not uncommon in blues tunes.

Parallel Keys in "Kiss From A Rose" (Seal)

This exemplary song is worth downloading and studying. It stands out musically for several reasons:

- It's in triple time, not quadruple.

- The chords move in powerful *second progressions*. Yet, except for the middle eight, the song has only three chords, all simple triads.

- The most compelling musical characteristic is the use of simultaneous parallel keys. The main chord progression is VI – IV – V – VI, all *major* chords, including the tonic VI chord, which would normally be VIm. (There's an occasional passing reference to VIm.) Although the harmony is overwhelmingly major, the melody is mostly *minor*. If you play guitar, clamp your capo on the third fret and play the chord progression E – C – D – E, with E major being the tonic chord (it would normally be E minor) and the melody mainly using the E minor scale (keyboard chords: G – E♭ – F – G; melody: G minor scale). The parallel minor melody against the major chords creates an arresting, stirring listening experience.

9.15 10 Techniques for Creating Emotionally Powerful Tunes (#10): Incorporate a (Repeating) Melodic Climax

9.15.1 MELODIC CONTOUR AND CHARACTER

In spoken language, if you want to emphasize something, or get someone's attention, you either *raise* the pitch of your voice beyond normal level, or you *lower* the pitch of your voice to create the impression of power.

Similarly, in melody, the highest pitched notes within a sequence of notes attract listener attention. And so do the lowest-pitched notes. They stick out, just as accented non-chord tones stick out.

You can think of melodic phrases as behaving like single elastic strands. As the tune moves up or down in pitch, the elastic is stretched. The higher or lower the melodic phrase extends from equilibrium, the more tension—which, of course, needs to be resolved.

In general, notes that occur on strong beats contribute more to the perception of the direction and shape of a tune than notes that occur on weak beats.

A cohesive melody usually has a *curve* to it—or, more accurately, a series of little curves and bends that contribute to the overall curve, the *melodic contour*. It's the contour of a melody that imbues a it with an identity or character that helps make it memorable.

In a popular song, the melodic contour consists of each of the unique VM phrases that make up the verse, chorus, and middle eight, considered collectively. The combined effect of the little melodic curves (a few notes each) is usually to create an overall contour that either rises towards some mid-point, then falls to the end, or, less commonly, the reverse.

9.15.2
MELODIC CLIMAX: IT'S NOT LIKE IN THE MOVIES

Somewhere in the contour of a well-structured melody, a *melodic climax* occurs. But it's not like the formulaic climax of dramatic action in a novel, TV drama, or movie, where the action and conflict steadily climb until there's a climax just before the end. Melodic contours and climaxes don't usually work that way.

- At least one note in each unique VM phrase (i.e., each VM phrase considered without its repetitions) *is* the highest note of the phrase— whether you try to create a climax or not.

- That climactic high note of a song may occur almost *anywhere* in a good melodic contour—not only at the end, as in a novel or movie. It may occur in the verse or the chorus or the middle eight. Usually the chorus, often the verse, occasionally in the middle eight.

- The climactic note usually occurs *several times* in a good melodic contour, not just once—again, unlike the climax of a story. That's because both choruses and verses *repeat melodically*, even though verses do not repeat lyrically.

- At least one note in every VM phrase *is* the *lowest* note of the phrase, again, whether you plan it to be or not. And that note may well serve the same climactic function as the highest note. A fine example is Johnny Cash's original 1956 recording of "I Walk The Line," discussed earlier (Section 6.12.5). When Cash begins the last verse in a low tessitura, tension increases. The listener wonders ... will he or won't he be able to reach that low, low note coming up?

Because of the comparative brevity of VM phrases, one VM phrase may have several occurrences of its highest note, but the next VM phrase in the same period may then have only one or two occurrences of its highest note, which, if higher than the highest note of the first VM phrase, serves as a melodic climax of the period.

For example, in the first eight bar period of each verse of Dylan's "Like A Rolling Stone," the first VM phrase (contained within the first four-bar structural phrase) has about ten occurrences of the phrase's highest note. But the second VM phrase has only two (on the words, *didn't you?*), which are higher than the highest notes of the first VM phrase. Melodic climax in this case works within an eight-bar period, instead of within a four-bar phrase.

But *didn't you* is not the song's melodic climax. That occurs in the chorus, on the first iteration of the word *feel*, as in *How does it feel?* On the word *feel*, the chord is the tonic chord, comprised of scale degrees 1, 3, and 5. But the word *feel* occurs on scale degree 4, the highest note of the song, on beat one of bar one of the chorus (the words *how does it* constitute a three-note anacrusis). So it's an *accented non-chord tone.* That's why that particular note sticks out. It does not recur in the remainder of the chorus, so it functions as the melodic climax. (The same note does appear elsewhere, but not in the form of a non-chord tone on an accented beat, so in those instances, it does not have a climactic effect.) Moreover, that high scale-degree-4 climactic note does not resolve to a consonant note, which makes it stand out even more.

9.15.3 NO NEED TO OBSESS ABOUT WHERE TO POSITION THE CLIMAX

In a popular song, the climactic note (or notes) occurs several times—every verse or every chorus. That's why it's not necessary to worry about carefully placing the climactic note at the end of a verse or chorus. You don't have to plot melodic climax the way a scriptwriter plots a dramatic climax. In "Like A Rolling Stone," the climax occurs at the *beginning* of the chorus—not at the end.

In Jerome Kern's "The Way You Look Tonight," the first note of the second eight-bar period is a higher note than any of the notes in the first eight-bar period, and serves as the climactic note of the 16-bar verse. And that note occurs smack in the *middle* of the verse (bar nine, beat one)—not at the end.

In "The Star Spangled Banner," the tune reaches the climactic note in two places, once in the middle of the tune on the words *red glare,* and again near the end on the word *free*.

9.15.4
SATURATION TONES DISSIPATE MELODIC TENSION

A listener's brain will register the highest and lowest notes of a VM phrase as standout notes. They create tension that gets resolved. But too many instances of the highest or lowest note in one phrase may dilute the climactic quality.

In creating original tunes, watch out for a *saturation tone*. Such a tone, as the name suggests, keeps recurring in a melodic phrase. A saturation tone makes a tune boring (far left side of the Wundt curve). It often occurs in what would otherwise be a climactic position.

So you need to be aware of the number of times the highest (and lowest) tone occurs in each unique VM phrase. If it's more than once or twice, you may need to edit out some repetitions of those highest or lowest notes so that the climactic effect does not get diluted.

9.15.5
MELISMAS MAY DISSIPATE MELODIC TENSION, TOO

Melismas were discussed briefly in Section 3.1.4. A melisma is a sung syllable that varies in pitch. Sometimes all over the place. You can think of an ostentatious melisma as the opposite of a saturation tone. Gymnastic melismatic improvisation is a specialty of some expressive singers.

Alas, if a singer specializing in wild melismatic improv isn't careful, he or she can end up blurring a fine melody, obscuring its identity, and dissipating the tension required for an audience to perceive the melodic climax.

This does not usually apply to a great singer's melismatic interpretation of a well-known song. The singer can take liberties with the melody because the audience already knows the tune as it was originally composed. Many of the immortal jazz and R & B artists have made effective use of melisma technique to create dazzlingly original interpretations of classic songs.

But when a song is new, *unknown* to an audience, intricate melismas that an unwary singer uses to embellish the tune end up *defining* the melody instead, in the minds of listeners—not simply *embellishing* the melody. With the singer effectively re-composing the tune on the fly, the odds of the original melodic curve and climax surviving are slim. The audience never hears the original tune, but instead hears a

melody that's complex and confusing, given the limits of short-term memory (far right side of the Wundt curve). The tune does not stick.

9.15.6 EMOTIONAL EFFECTS OF MELODIC CONTOUR

Here are some reported emotional effects of melodic direction and contour. See also Sections 3.4.2 and 4.4.

TABLE 71 Emotional Effects of Melodic Contour (Much Depends on Context ...)

Contour Characteristic	Associated Emotions
Rising	Questioning, uncertainty, increasing tension, happiness, fear, anger, dignity, serenity
Falling	Resolution, sadness, grace, boredom, pleasantness
Wandering, hesitant, unfocused	sadness
Gradual rise and fall	Tenderness
Leapwise motion	Excitement

9.16 Putting It All Together: A Suggested Approach to Composing Tunes

9.16.1 IF THE NET'S DOWN, THERE'S NO STRUCTURE, NO COMPREHENSION ... AND NO EMOTIONAL CONNECTION

> I'd just as soon play tennis with the net down.
>
> —ROBERT FROST

That's how Frost dismissed free verse. His comment fits the art of songwriting perfectly. You cannot write great songs unless you have the net up—a willingness to learn, and play by, the "rules," the *composition techniques* that make a tune intelligible and enable emotional communication.

A song exists in *time*, not in space, so it absolutely must reveal discernable structure and patterning as it unfolds, second by second, minute by minute. If it doesn't, listeners will not be able to make sense of it, remember it, and connect with it emotionally.

Lennon and McCartney, Irving Berlin, and other "musical illiterates" knew an awful lot of composition technique. By the time they hit their stride as songwriters, they knew most or all of the technical material discussed in this book (particularly in Chapters 6 through 10). When they came up with ideas or fragments that might work out as songs, they applied their technical know-how and turned those ideas and fragments into fully-realized brilliant songs.

> **The evidence of the technical expertise of great songwriters such as Irving Berlin and Lennon-McCartney and is right there in the songs—in the recordings and in the sheet music transcriptions.**

By contrast, 99.9% of aspiring songwriters are clueless about effective composition technique. Which is why nearly all songwriters turn out only generic, mediocre, forgettable songs. And that includes songwriters with *Billboard* hits.

It doesn't matter how intelligent you are.
It doesn't matter how imaginative you are.
It doesn't matter how many songs you've already written.
It doesn't matter how hard you've worked on your music.
It doesn't matter how well you can sing or play an instrument.
It doesn't matter how good you are with computers and recording gear.
It doesn't matter whether or not you come from a musical family.
It doesn't matter whether or not you can read or write music.

If you don't become skilled in composition *technique*, you will rarely or never write a single brilliant song.

Each of the greats who wrote a body of classic songs had one thing in common: *technical mastery*—an understanding of intervals, chords, progressions, pulse types, meter, tempo, rhythm, vocal-melodic phrase, structural phrase, binary form, melodic coherence, melodic and harmonic cadence, and the various techniques for making tunes effective and compelling.

You or anybody else with an imagination who *takes the time* to master these technical elements and apply some imagination can become a great songwriter.

What follows is a suggested approach to composing original songs. It's based on everything covered so far in this book.

- In this approach, you start with the music and work your way into the lyrics.

- Section 10.14, towards the end of the next chapter, discusses the reverse approach—starting with lyrics meant for a melodic setting, or lyrics meant for rapping, then adding the beats, tunes, harmonies and other musical elements.

9.16.2 WHERE TO BEGIN? WITH PRE-SELECTIONS

A first step to learning how to compose original, coherent, emotionally compelling tunes is to spend some time becoming confident working with the four "pre-selection" song elements. This will get you out of the habit of slipping into your comfort zone—playing with the net down. It will require you (force you!) to gain an understanding of aspects of meter, tempo, rhythm, and mode that you've never tried in your songwriting.

Go back to Section 9.5.3. Each of the 16 examples lists the song's meter, tempo, and VM phrase start point. You probably know most of the melodies. You can learn the ones you don't know from the 30-second excerpts at download sites such as iTunes or PureTracks or any other such site.

The 16 songs in Section 9.5.3 are sequenced such that there's a lot of variety from one song to the next. As an exercise, go through the following steps with all 16 songs.

1. ***Whip out your pocket digital recorder.*** If you don't have one, get one. They don't cost much. A mini recorder will save you a ton of time. And it will enable you to capture melodic and lyrical ideas that flow capriciously into, and irretrievably out of, your short-term memory.

"I CAN'T GET NO ... ZZZZZ"

Keith Richards woke up one morning in1965 with the "Satisfaction" guitar riff in his head. Fortunately he had a habit of keeping a cassette recorder by his bed. So he grabbed a guitar, taped the riff, and went back to sleep, forgetting to turn the machine off. "On the tape you can hear me drop the pick," he explained in a *Rolling Stone* magazine interview. "The rest of the tape is snoring."

2. ***Whip out your digital or mechanical metronome (or other beat-making device).*** If you don't have one, get one. Like a pocket recorder, a metronome is an essential tool for a songwriter.

3. ***Go to Section 9.5.3, Song 1, "Space Oddity."*** Note that the meter is simple quadruple and the VM phrase start-point is *after* beat one, bar one of the structural phrase. The tempo is slow—65 BPM. Set the metronome going at 65 BPM, at a volume level that the recorder will be able to capture. **NOTE:** If you have a metronome or other digital device that can be programmed to do any number of fancy rhythmic things—*resist the temptation*. Just set it to sound like an ordinary metronome: single audible beats or clicks at the indicated tempo, nothing more.

4. ***Switch the recorder on, do a verbal count-in, and hum or sing syllables*** to the tune that goes with the lyric, *Ground control to Major Tom*. **Don't sing the words.** Instead, use a syllable to voice the notes of the tune—"dah-dah-dah-dah"—or whatever syllable you're comfortable with. For now, you're simply learning a technique for capturing a discernable *tune*—not lyrics—in a recorded medium.

After going through the 16 songs, if you feel you aren't completely confident working with pre-selected elements, keep at it, using *classic songs* (not obscure or unrecorded songs) of your own choosing. For each song, draw an eight-bar period diagram:

- Ascertain the meter; use the list in Section 9.6.2
- Use your metronome to get the tempo
- Locate the first VM phrase start-point with respect to the structural phrase
- Determine the mode
- Shade in the VM phrases, as in Section 9.5.3 (With some songs, structural phrases may be longer or shorter than four bars. If so, you'll need to adjust your diagram accordingly.)

9.16.3 NEXT: ORIGINAL RHYTHM PATTERNS

Once you're satisfied you know how to handle pre-selections, focus on creating original rhythm patterns:

- Start by doing four pre-selections. Review Section 9.6.4, which has an example, including an *eight-bar sketch*. Use that one, or do one of your own.

- When you're ready to compose, don't work on melody right away. Instead, work on *rhythm patterns*. As previously mentioned, rhythm is the soul of melody. So focussing on rhythm patterns will get you thinking about how much a unique rhythmic scheme contributes to the appeal of a captivating, memorable tune (recall, for example, Gershwin's "I Got Rhythm" rhythm pattern). An interesting rhythm pattern gives a melody identity and helps make it more memorable. Syncopation—pitch accents on metrically weak beats—makes melody more memorable. But if the rhythm pattern is too complex, it becomes *less memorable* (Wundt curve!).

- With the metronome going, and with a *count-in* (important!), start recording *raps*—without melody—of irregular rhythm patterns. No words—just use a syllable of your choosing. Any pattern will do except the strict 1-2-3-4 of the underlying beat. The skill you're working on is fitting *original* rapped, rhythmic phrases into eight-bar periods.

- Leave spaces between the rapped phrases roughly every five to ten syllables.

  Two of the biggest preventable mistakes you can make are:

  1. **Creating *long* or *convoluted* rhythm patterns; and**

2. **Creating too many *different* rhythm patterns for one song.**

A few short phrases *that repeat* work much better than waves of long phrases that nobody can remember. If you ever doubt this, review again the 16 songs in Section 9.5.3, and the summary table following song 16.

- With each take you record, stick with your *pre-selected elements*, at least until you've recorded a few samples. (Songwriting takes discipline. Whips, chains, dog collars.) Always do a count-in, and always start your first phrase in the pre-selected position with respect to beat one of bar one of the structural phrase. When you listen to the playback, your vocal count-in and your eight-bar sketch will orient you to where the phrases are located within the eight-bar period, even though there's no instrumental accompaniment except the metronome.

Try the above with a variety of pre-selection sets, not just one. Work at it until you're satisfied and confident that you can create original raps of rhythm patterns within the parameters of *any set* of pre-selected elements (except scale type, which is irrelevant at this stage).

9.16.4 NEXT: ORIGINAL MELODIC PHRASES—NO LYRICS (YET)

Now you can use the same approach to work out original melodic phrases. At this stage, with melody in the picture, you may want to go back and review the "10 Techniques for Creating Emotionally Powerful Tunes" discussed in this chapter.

A few suggestions for working on your original melodic phrases:

- ***Resist the temptation to use lyrics.*** Not yet. (That's next.) The idea at this stage is to focus on creating original, coherent melodic phrases that fit within eight-bar period structure.

- ***Don't use a musical instrument to record your original tunes.*** Use your *voice* with a syllable of your choice. The human voice is far more expressive than any musical instrument. Using your voice will also prevent you from creating impossible-to-sing-but-easy-to-play melodic phrases.

- ***Now's the time to grab your guitar or sit down at your keyboard (finally).*** Be aware that you will probably find yourself playing only the chord changes

you're already completely familiar with. Which can cause you to slip dangerously into boring old Comfort Zone Land.

On the other hand, using a guitar or keyboard will enable you to efficiently do melodically creative things:

- Recognize opportunities to insert accented non-chord tones
- Work out the placement of cadences
- Experiment with modulation
- Experiment with multiple melodies using the same rhythm pattern
- Work out chord progressions for sequences

9.16.5 NEXT: ORIGINAL VM PHRASES (WORDS AND MUSIC)

It's likely you have some lyrics kicking around, maybe some lyrics you haven't set to music yet. If you have no lyrics except those to which you've already set music, start fresh. Scribble out some new lyrics. You may want to read Chapter 10 first. If you're stuck, use a poem. (It's been said that you can sing any of Emily Dickinson's poems to the tune of "The Yellow Rose Of Texas." Try it!)

Pre-selections and Set-up

Once you've settled on a lyric, do your four pre-selections, based on the feel you think would suit the lyric.

1. ***Meter.*** Is the lyric more suited to quadruple or triple meter?

2. ***Tempo.*** What speed would suit the words? Use a metronome and experiment with fast and slow and moderate tempo settings as you go over the words until you settle on a tempo that feels right.

3. ***VM phrase start-point.*** Should the first VM phrase start before, on, or after beat one of bar one of the structural phrase?

4. ***Mode or scale type.*** Would the lyric work best in a major key, a minor key, or a Church mode?

Draw an eight-bar diagram on the back of a coffee- or wine-stained envelope (of course) and jot down your pre-selections.

Next, on a printout or copy of the lyrics, mark or underline the *accented syllables* of all the words. This will help you avoid the awkwardness that comes of failing to adhere to the Accent-matching Law when setting words to music (Section 8.2.6).

Now you're ready to start composing with words.

But first ... you will probably want to review the summary information in Table 68, And also, the summary information at the ends of Chapters 7, 8, and 9 (Section 9.17). You won't remember everything until you've gone over the material in this book many times. Eventually it'll sink into your long-term procedural memory.

Rapping and Accent-matching

Next, with metronome and recorder going (and remembering to do a count-in with each take), work out rhythm patterns for a couple of lines of the lyric. Never mind melody for the moment. *Just rap the lyrics* until you've got the structure and rhythm worked out. Then pencil the lyrical phrases into your diagram where they occur in the eight-bar period. Pay attention to lyrical accents and keep the dang Accent-matching Law in mind: if metrical and verbal accents don't coincide, the lyric will sound awkward and amateurish.

Now you're finally ready to add melody and chords. You've got the melodic rhythm pattern(s) worked out. You've remembered not to make the phrases too long (only a few words each). And you've left sufficient space between the phrases.

Since you're now about to put all the elements together, including chords, a review of Chapter 6 on chords and chord progressions might be in order. Especially Table 51 and the chord progression guidelines at the end of the chapter.

Adding Melody and Harmony

If you have an exceptional memory for harmony, you might find it easier to work without a guitar or keyboard and work out the harmony in your head. Otherwise, use a guitar or keyboard for the reasons listed a couple of pages ago.

Switch on your recorder and metronome and start setting melodies to words, using your four pre-selections and the rhythm patterns you've already worked out.

Use the *Chord Progression Chart* for reference (Appendix 1), and keep in mind the strengths and weaknesses of fifth, third, second, and chromatic progressions.

When composing like this, stick with four-bar structural phrases and eight-bar periods until you're completely comfortable and confident about working with shorter or longer structural phrases and periods.

You'll probably find it easier to come up with melodic phrases that have character and coherence if you *close your eyes*. Visual perception occupies a large amount of

your brain's attention and your short-term memory. Getting rid of all that distracting information by closing your eyes while you're composing may enable you to focus more easily and imaginatively on the imagery of the lyrics, and on melodic and harmonic patterns. (Composers and songwriters often report that they wake up from a dream state with a great tune in mind.)

Expect your initial efforts to not turn out terribly well. It will take you some time to work through, understand, and absorb into long-term memory all the technical stuff in the last half dozen chapters or so. It's a lot of material, and it'll take you more than a few weeks (or months) to grasp it all.

Your first efforts may have any number of musical weaknesses such as:

- Few or no non-chord tones on accented beats
- Lyrics that defy the Accent-matching Law and sound silly
- Too many unique (unrepeated) VM phrases
- VM phrases that run on too long
- No discernable melodic climax
- Not enough leaps, or too many leaps
- Too many instances of pointless repeated tones
- Not enough note value variety
- Not enough space between VM phrases
- Not enough strong chord progressions
- Not enough cadences involving the V chord

Eventually, you'll develop good composition habits and automatically avoid weaknesses such as those listed above. And, if you have the imagination, you will be able to write great songs at will, with or without the approach suggested in this section.

MIESKUORO HUUTAJAT (THE CHOIR OF SHOUTING MEN)

Sometimes melody must take a back seat to … to … well … ***shouting.*** That's the style of Mieskuoro Huutajat. "The Star Spangled Banner" has not been performed with such originality since the Jimi Hendrix rendition at Woodstock.

You'll find it worth your while to visit the website of this astonishing Finnish choir, download their short free video, and let them have a go at your musical sensibilities. Here's the website:

www.Huutajat.org

9.17 Melody: Unity, Variety, and Emotional Impact

9.17.1 Optimizing Unity and Variety in Melodic Composition

As you review the material in this chapter (over and over), pay particular attention to the songs and recordings cited as examples. Download or purchase the recordings you don't already have and play them until you understand the concept being illustrated.

Table 72 below summarizes the main concepts to retain about melodic composition.

TABLE 72 Optimizing Unity and Variety in Melodic Composition

	Prefer…	Instead of…
Melodic range	• Writing tunes with a reasonable compass, averaging an octave or so, and no more than an octave and a fifth.	• Writing tunes that span less than a fifth or more than an octave and a fifth.
Tonality	• Using scale degrees 1, 3, 4, and/or 5 on metrical accents early in the tune to help establish tonality	• Writing tunes without regard to tonality
Harmonic speed	• Composing occasional passages in which harmony moves at the same speed as melody, or faster	• Always having harmony move slower than melody
Cadence	• Relatively frequent use of cadences involving the V chord to ensure melodic cohesiveness • Occasional use of feminine cadences, especially with leaps	• Writing tunes without regard to cadence
VM phrases	• Frequently starting VM phrases on or after beat one of bar one of the structural phrase • Keeping most VM phrases short—about 7 $\pm$ 4 syllables • Leaving lots of space between VM phrases • Using either 2 or 4 VM phrases in a typical 8-bar period	• Starting every VM phrase with an anacrusis • Writing long, wandering VM phrases • Paying little or no attention to VM phrase spacing or numbers of phrases or periods

Composition technique	• Using the 10 specific techniques discussed in this chapter • Using the approach to composition outlined in Section 9.16 to get the hang of composition technique	• Writing songs randomly, hoping to come up with something brilliant

9.17.2 MUSIC FIRST, OR LYRICS?

Once you understand composition technique, it doesn't matter. Whether you start with music or with lyrics, if you know musical and lyrical composition technique, you'll know how to shape the elements into a focussed, coherent, emotionally powerful song. If you don't know technique, it doesn't matter whether you start with music or lyrics. You'll turn out an unfocused, incoherent, forgettable song.

SAIL HORSING

> *Take most people, they're crazy about cars. I'd rather have a goddamn horse. A horse is at least human, for God's sake.*
>
> —J. D. SALINGER

Before moving on to Chapter 10, why not take a break and do some recreational sail horsing to clear your mind? Never heard of sail horsing? No wonder. It's a relatively new recreational activity.

In Chapter 1, you learned that, if you whisper the right things in your horse's ear, you can lead him (or her) to water and get him (or her) to float on his (or her) back.

Recreational "sail horsing" exploits this phenomenon.

As you know, when floating on their backs, horses point their legs straight up. You can use their legs as little masts and secure sails to them. They don't mind. There's a place in Oregon called the Columbia River Gorge that has strong steady winds most days—excellent for sail horsing. The nearby town of Hood River

has several good sail horsing supply shops where you can get sails for any horse leg size, live shoulder parrots, eye-patches, and such. They'll even supply you with horses on a rental basis, which they have shipped to Oregon all the way from the Dodge City Horse Store.

10

How Lyrics REALLY Work

I love songs about horses, railroads, land, judgement day, family, hard times, whiskey, courtship, marriage, adultery, separation, murder, war, prison, rambling, damnation, home, salvation, death, pride, humor, piety, rebellion, patriotism, larceny, determination, tragedy, rowdiness, heartbreak, and love. And Mother. And God.

—JOHNNY CASH

10.1 Evolution and Language: The Biology of Lyrics

10.1.1 Great Lyrics: An Organizing Principle

According to renowned literary theorist Northrop Frye, "Criticism is badly in need of an organizing principle, a central hypothesis which, like the theory of evolution, will see the phenomena it deals with as parts of a whole." Such an organizing principle already exists, however, needing only to be recognized and developed. Ironically, it is the same one Frye gestured toward so longingly: evolution.

—DAVID BARASH AND NANELLE BARASH

Evolution created humans. So, in storytelling that's humanly interesting and emotionally powerful, *genetic predispositions* motivate the characters. Great writers, from Sophocles to Shakespeare to Dylan, have always been great *intuitive biologists.*

In their Darwinian examination of literature, *Madame Bovary's Ovaries,* David Barash and Nanelle Barash show how classic literary works reveal human nature as shaped by natural selection:

> Human beings, like all other living things, are biological critters, products of evolution by natural selection ... Great literature reflects certain human universals ... Men taking sexual advantage of women; women often doing the same thing, although typically in different ways. Competitiveness, whether violent or more subtle. The selfish underbelly of friendship. Nepotism (favoritism toward relatives) often combined with discrimination against strangers. ... The nature of human nature is becoming clear. One of its cardinal principles—reflected in literature—is the gravitational pull exerted by what Richard Dawkins first labeled "selfish genes," a force that influences not only what people do but also the stories they tell about themselves, including what they find interesting, boring, perplexing, and frightening.

In most genres of popular music, lyrics play a leading role, not a supporting one. It's no accident that only about 10% of the 5,000 songs on the *Gold Standard Song List* have no lyrics—mainly jazz, where melodic improvisation is central, and dance/electronica where rhythm dominates.

"I'M A SCIENTIST-SONGWRITER, AND MY COLLEAGUES POINT AND LAUGH. HELP!"

Fear not, scientist-songwriter. You can remain a scientist *and* write songs about science for money. That'll show 'em. Just hop on your horse and ride on over to the **Science Songwriters' Association** at www.Science-Groove.org/SSA

If you write songs about, say, astrophysics or food toxicology, why, there's a market for your songs. For instance, Dr. Carl Winter, "the Elvis of *E. Coli*," is a scientist whose songs about bacteria and related topics have sold tens of thousands of CDs. Visit his website at http://Foodsafe.ucdavis.edu/music.html and have a listen to hits such as

- "Don't Get Sicky Wit It" (inspired by "Gettin' Jiggy Wit It")
- "They Might Kill You" ("We Will Rock You")

- "Fifty Ways To Eat Your Oysters" ("Fifty Ways To Leave Your Lover")
- "Clonin' DNA" ("Surfin' USA")

10.1.2 SYMBOL-MAKING AND SYMBOL-PROCESSING

As discussed in Section 1.3.16, lots of other animals besides humans have culture. They make and use tools, learn skills from peers and parents, and pass on their expertise to others. But only *H. sapiens* deliberately creates and uses *symbols*—things that carry useful *information*. Even way back in Palaeolithic times, humans used symbols such as costumes, tattoos, and jewellery to communicate information such as social status and ownership.

As you know, the ultimate in the human use of symbols is language. Oral language enables communication of information at a sophisticated level. Written language enables the *storage* of information outside of the brain. Writing overcomes memory limitations and enables the accumulation of wisdom. Although humans can teach animals to understand some symbols ("Fido ... sit!"), animals don't *create* and *manipulate* information-bearing symbols.

When you hear a song, you understand the meaning of the word-symbols before your brain has time to process the accompanying music. Your brain processes the words and music *independently*. If the words pack emotional punch, and the music does too, then you experience an extraordinary emotional hit.

People sang melodies long, long before playing tunes on musical instruments. Researchers working with kindergarten children have demonstrated that, when you present new words in the form of *lyrics* with melodies, children learn to read much faster than kindergarten children who learn to read by conventional teaching.

Recall from Section 1.3.12 that if you suffer damage to Broca's area in the *left hemisphere* of your brain, you will have difficulty speaking the lyrics of a song, but not *singing* the lyrics. That's because ...

> When words and music are closely associated, as in the words of songs, it seems that both are lodged together in the right hemisphere as part of a single Gestalt. Since the word order of a song is fixed, the innovative verbal skills which belong in the left hemisphere are not required.

As a lyricist, a manipulator of word-symbols, you have to work within the constraints that music imposes. Lyrical accents have to match the accented beats of the music, ends of phrases have to rhyme, and so on. That's why translation of lyrics from one language to another necessitates completely rewriting the lyric, a process

that often compromises the cultural, symbolic, and figurative elements of the original lyric.

10.1.3 "I HEARD IT THROUGH THE GRAPEVINE": THE POWER OF GOSSIP

There's a direct correlation between primate group size and neocortex size. As discussed in Section 1.5.8, *H. sapiens*, the primate with the largest neocortex, is the most social, supporting the hypothesis that natural selection has driven primate cognitive adaptations for acquiring and using social information. Humans rose to the top of the food chain by evolving keen social intelligence, the ability to successfully cooperate, share information, and defeat the defences of other organisms.

Gossip is information humans exchange about each other. It has both survival and reproductive value. The more you know about everybody else, the more social power you have. The more likely you will succeed in passing on your genes. You can use the information you acquire about others to predict with greater accuracy how others will behave in situations that affect your mating activities, social status, friendships, alliances, and so forth.

Why is gossip usually more associated with females than males? And why did females evolve better verbal skills than males? For one thing, females tend to be more empathetic than males, and therefore more likely to exchange information with each other about each other and about others in the social group. Gossip builds alliances.

As well, according to the noted developmental psychologist Simon Baron-Cohen:

> You find a sex difference in how aggression is shown. Males tend to show far more direct aggression (pushing, hitting, punching, and so on). Females tend to show more indirect (or relational, covert) aggression. This occurs between people without them touching each other, or behind people's backs, and it includes things like gossip, exclusion, and bitchy remarks.

For tens of thousands of years, people have been intensely interested in gossip about kin, friends, rivals, and those of high status. Such information has always been handed down in the stories and songs that comprise the oral tradition. This has not changed.

Well-written lyrics that amount to gossip about the private lives of fictitious characters—who is sleeping with whom, who is lying, who is telling the truth, who is jealous or envious of whom or what—invariably capture a listener's attention. Especially lyrics that *name names* (i.e., proper nouns). The higher status the person

named, the more interesting people find the gossip, because high-status individuals have the power to influence the lives of ordinary people.

10.2 Lyrics In Semantic Space: The Central Importance of EPA

> To say, furthermore, that we all have use for both denotative and connotative meanings is but to say that we are all both scientists and artists ... Whenever we wish to make something exciting or vivid, we call upon the resources of connotation and use words as an artist ... No one can write with color, force, and persuasiveness without control over connotation.
>
> —RICHARD M. WEAVER

10.2.1 THE PROBLEM OF PINNING DOWN CONNOTATIVE MEANING

Skill with language means knowing how to handle the two distinctly different kinds of meaning that most words and phrases convey *simultaneously*. Here's how *The Oxford Companion to the English Language* defines them:

- ***Denotation***, also known as *cognitive meaning*, refers to the direct relationship between a term and the object, idea, or action it designates.
- ***Connotation***, also known as *affective meaning*, refers to the emotive and associational aspect of a term.

Of the two, connotative meaning—the emotions a word or phrase evokes—is of greater interest to creative writers such as novelists and lyricists. A lyric is an *emotional effusion*, not a rational commentary or observation.

Words such as *celebration, springtime*, and *kiss* automatically arouse unique assemblages of positive emotional connotations in most people. Words such as *homeless*, *cancer*, and *rape* summon clouds of negative emotions. Many words and

phrases, such as *bullfight*, evoke mixed positive and negative emotions. Connotative meaning also includes other sensations and impressions, such as power (e.g., *war*) and activity (e.g., *carnival*).

For hundreds of years, lexicographers have systematically codified the *denotative* meanings of words. Collections of definitions evolved into dictionaries, thesauruses and related denotative language reference tools. However, connotative meaning has eluded such codification.

While words readily evoke emotional connotations, the converse is not true: emotional connotations are not easily codified using words. Unlike denotative meaning, emotional or affective meaning does not naturally lend itself to systematic word-symbol codification because emotions are felt, not thought. Lexicographers cannot employ their usual methods to codify the relationship between a word and its associated connotative content.

10.2.2 TOWARDS A SOLUTION: ATTITUDE MEASUREMENT

People adopt attitudes, hold opinions and experience emotions of both positive and negative valence in varying levels of intensity. To investigate "attitude" and measure its intensity, investigators typically use rating scales. They use statistical techniques founded upon mathematical proofs such as the Central Limit Theorem to analyse numerically-scaled data.

In the 1920s and 1930s, psychologists L. L. Thurstone and Rensis Likert pioneered attitude measurement scaling methodologies. Thurstone's contribution was a type of "differentiated" scale, a scale that would, with acceptable accuracy, determine a person's attitude towards an object or concept along a continuum.

Likert, a psychologist investigating corporate management styles, devised a "summated" scale, a type of attitude scale that allowed for the summation and averaging of scaled responses. An example of a Likert scale is this familiar sequence:

❍	❍	❍	❍	❍
disagree strongly	disagree somewhat	neither agree nor disagree	agree somewhat	agree strongly

Many variations evolved over the ensuing decades. The Likert-type scale proved robust, and is widely used today.

10.2.3
LINKING WORDS WITH ATTITUDE: CHARLES E. OSGOOD'S "SEMANTIC SPACE"

> The Evaluation, Potency, and Activity (EPA) structure in subjective responses is one of the best documented facts in social science, and an elaborate technology has developed for measuring EPA responses on "semantic differential scales."
>
> —DAVID R. HEISE

The scale types devised by Thurstone, Likert and others did not explicitly connect scaled attitude measurement with attitude as manifested in the connotative meanings of words. The American psychologist Charles E. Osgood (not to be confused with the writer and broadcaster Charles Osgood) is credited with this breakthrough.

In the 1950s, C. E. Osgood and his colleagues at the University of Illinois used *Roget's Thesaurus* to construct a different type of bipolar attitude scale, which they called the "semantic differential" scale (*semantics:* the branch of linguistics that deals with the meanings of words and sentences). Osgood's new semantic differential was based on semantic opposites, such as *good-bad, soft-hard, fast-slow, clean-dirty, valuable-worthless, fair-unfair,* and so on.

The researchers enlisted numerous "judges" (i.e., ordinary people recruited to express their attitudes) to evaluate large numbers of concepts, ideas, and objects, expressed as words and phrases, on many semantic differential scales.

Then Osgood's team used a statistical technique called factor analysis to analyse the large amount of numerical data generated by the judges. This technique enabled the researchers to identify the underlying attitudes the judges were really expressing — unconsciously—when they were rating various objects and concepts.

The outcome was Osgood's momentous discovery of "semantic space." Osgood's discovery has since been verified by many other researchers in many other countries and cultures, using many other languages besides English.

Semantic space is a *human universal*.

What is semantic space?

Osgood and other researchers discovered that, regardless of language, nation, or culture, people everywhere evaluate everything in their social environment according to three measurable dimensions, which Osgood labelled Evaluation, Potency, and Activity, or EPA. When you encounter something in your environment, you judge it like this:

- ***Evaluation:*** How good or bad for me is this thing?
- ***Potency:*** How powerful or weak is this thing?

- ***Activity:*** How active or passive is this thing?

C. E. Osgood's take on the origin on these three dimensions was Darwinian. He hypothesized that natural selection led to the evolution in humans of a universal way to evaluate their personal environment. When confronted with something new, such as a snake or a deer or another human, the human brain would need to automatically evaluate, accurately and quickly, whether the situation was good or bad, whether the thing confronted was powerful or weak, and whether it was active or passive.

Humans would unconsciously apply this evaluative process to everything they encountered, every object, every situation, every living thing, including fellow humans. Facility with EPA evaluation in day-to-day life conferred survival and reproductive benefits. Researchers using semantic differential technique in other languages and cultures have demonstrated that humans everywhere use the same EPA evaluative process today.

What's the significance of the properties of semantic space when it comes to writing lyrics?

- Words and phrases symbolize objects and concepts. Therefore, each word and phrase has certain EPA intensity levels automatically associated with it. These EPA levels—*connotations*—are *fixed in the brains of every human* from the time he or she learns and clearly understands denotative meanings. EPA intensity levels vary from word to word, but those intensity levels hold relatively steady for each word *across a population.*

- Of the three EPA dimensions, "E" (Evaluation) is the most important. Osgood and other researchers found that, as the *affective (emotional) dimension, "E" is the primary indicator of a person's overall attitude* toward the object or concept.

- A writer who is aware of the reality and universality of EPA can consciously choose words and create phrases that maximize emotional impact: *high-EPA* words. Exactly how to do this is the subject of Section 10.14.

Clearly, the valence and intensity of the emotion you experience when you hear a particular word or phrase will not be exactly the same as the valence and intensity of the emotion another individual experiences when they hear the same word or phrase. But it doesn't matter how *you in particular* feel when you hear a word or phrase. Or how any other single individual feels. What matters is how the *mass of people* in your society feel.

When researchers poll large numbers of people using the semantic differential technique, the results are remarkably consistent. The three dimensions of semantic space, E, P, and A, always emerge. People who share a language and the broad aspects of a culture tend to react emotionally in similar ways and with similar

intensity to the same object or concept. That's why words have both denotative and *connotative* meanings.

Suppose for some reason you find *apple pie* revolting. It disgusts and irritates you. That does not change the way the great majority of people feel about apple pie. They feel pretty good about apple pie. It's *your* emotional reaction that's anomalous; it does not represent the reality of semantic space in your society.

As a lyricist, the degree to which you understand the emotional meanings of words in semantic space *with respect to your society* will determine how effectively you select words for your songs, be they rap lyrics or lyrics set to melodies. If you know what you're doing, you'll select *high-EPA words, words that have intensely-felt connotative meanings for most people, regardless of positive or negative valence*.

SPEAKING OF SPACE ... A LYRICAL SCANDAL OVER THE AGE OF THE UNIVERSE

In 2005, the pop star Kylie Melua had a hit single, "Nine Million Bicycles," written by the British songwriter and producer Mike Batt. One of the verses of "Nine Million Bicycles" contained a glaring factual error:

We are twelve billion light years from the edge
That's a guess
No-one can ever say it's true
But I know that I will always be with you

Twelve billion?

Everybody knows the universe is 13.7 billion years old.

The physicist Simon Singh, author of *Big Bang: The Origin of the Universe*, got on the case. He called upon the songwriter and the performer to get the facts straight and re-record the song.

Ms Melua went back into the studio and did just that. The new verse:

We are 13.7 billion light years from the edge of the observable universe
That's a good estimate
With well-defined error bars
And with the available information, I predict that I will always be with you

That satisfied the scientific community and rioting in the streets immediately ceased.

However, Ms Melua continues to perform the song with the original lyrics because, apparently, the rewritten words do not fit the musical setting very well.

10.3 Lyrical Emotion: Choice of Words

10.3.1 CONTENT-WORDS VS FUNCTION-WORDS

Although nearly all words communicate two kinds of meaning simultaneously—denotative (rational) and connotative (emotional)—a small number of words don't convey much if any meaningful content, either denotative or connotative. It's useful, therefore, to distinguish between *content-words* and *function-words*.

- ***Content-words***, more than 99% of the words in a dictionary, carry significant *semantic* (i.e., meaningful) information.

- ***Function-words*** play a mainly *syntactic* role; that is, they're necessary for the text to make grammatical sense.

Function-words include:

- All eight forms of the verb "to be": *am is are was were be being been* (although in creative writing you can usually avoid using these weak linking verbs)
- The articles: *a an the*
- Most conjunctions, such as: *and but or nor if*, etc.
- Pronouns that do not refer to people, such as: *that which it*, etc.
- Prepositions, such as *at by of for*, etc.

Without the syntactic contributions of articles, conjunctions, impersonal pronouns, and prepositions, lyrics would sound halting and only semi-intelligible, like a pidgin dialect.

A lyric, unlike a poem, is meant to be sung or rapped, and music evolved to communicate emotion. So the first consideration in lyric writing is *maximizing emotional impact*. And the main thing to keep in mind at all times is that the emotions people collectively associate with various words and phrases vary greatly in both valence and intensity. You need to be able to tell the difference between words with strong connotative value (for most people) and words with weak connotative value (for most people), and select the former for lyrics.

Clinical psychologists use stress indexes when evaluating the health of patients. The words and phrases that name and describe stressful events in these indexes reflect the intensity of the emotions people associate with such events. Here are some examples from one such index, devised to code stress intensity experienced by famous classical composers (they tended to compose their most original music during periods of high stress):

Death of spouse	100
Divorce	73
Marital separation	65
Death of close family member	63
Detention in jail or exile to avoid arrest	63
Marriage	50
Marital reconciliation	45
Change in health or behaviour of a family member	44
Aversive change in financial state	38
Onset or termination of a reciprocated love affair	30

Lyrics that deal with topics such as marital break-up, criminal activity, and death of a loved one automatically tap into areas of semantic space that have powerful, high-EPA content-word potential.

Some topics and areas of human activity just don't lend themselves to lyrics (except in jest). For instance, science, philosophy, technology, and administrative bureaucracy all deal with abstract concepts and ideas. These are the domains of low-EPA words.

Incidentally, with a few onomatopoeic exceptions, there's no connection between the sound of a content-word and its meaning. A word is a symbol. If the word "rose" had originally been "fart," and vice-versa, everybody would say, "Yecchh! I smell a rose." And everybody would nod in agreement with Shakespeare:

What's in a name? That which we call a fart
By any other name would smell as sweet

10.3.2
SOME GUIDELINES ON WORD CHOICE BY PART OF SPEECH

Although you no doubt know your parts of speech, you may not be aware of how their use in effective lyric-writing differs from their use in everyday "rational" discourse. You may find the following advice helpful.

Verbs

Consider *action verbs* your best friends. Not *linking verbs* (aka *copula verbs*). Action verbs bring lyrics to life. Linking verbs express state, not action. **Do not use linking verbs unless you absolutely have to.** In lyric writing, avoid using the eight weakest linking verbs in the English language, namely, variations of the verb *to be*:

am is are was were be being been

You'll find that, in the process of editing out linking verbs, you will have to replace them with action verbs, which will bring your writing to life. Aim for no more than one linking verb for every 5 to 10 action verbs. For instance, instead of saying:

Her decision was to become skilled in food preservation,

say something like:

She decided to learn how to season, smoke, cure, and pickle.

Instead of saying:

She is an ace driver,

say:

She drives like an ace.

Getting rid of the verb *to be* when used with the preposition *by* has another benefit, apart from turfing the linking verb: you avoid using the *passive voice*. Instead of saying,

She was shown a good time by Carlos,

say,

Carlos showed her a good time.

Leaders of governments, corporations, and other institutions love using the passive voice because it hides the actor: *Mistakes were made*, they say, instead of, *I made mistakes.* Don't use the passive voice.

Also, keep an eye out for opportunities to change nouns into verbs. You can combine a noun with an action verb to create compounds such as *sidewalk-surf, moon-dance,* or *horse-whisper*.

Nouns

Nouns name people, places, and things. Along with action verbs, consider nouns your other best friends (although verbs have the edge), especially:

- ***Concrete nouns,*** which name things you can observe or touch or otherwise experience with your five senses

- ***Animate nouns*** which are concrete nouns that name people and animals: *man, woman, horse*

- ***Proper nouns:*** If something is important enough to warrant a name, it tends to have a high-EPA value. *Use proper nouns in song lyrics*—except for product and company names. A few examples of high-EPA proper nouns:

    - First names of people: *Carlos, Cassandra, Sadie, Ellie Sue,* etc.
    - Important geographical names: cities, regions, nations, continents: *New York City, Dodge City, New Orleans, Wichita, Spain, Paris, London, England, America, Dodge City, Caribbean, Rio de Janeiro, Dodge City*
      NOTE: In general, you increase listener comprehension of your lyrics if you provide references to place and time (see list of time-orienting adverbs below).
    - Names of special days and events: *Christmas, Independence Day, 9/11, Boston Tea Party*
    - Names of the days and months of the year: *Monday* through *Sunday, January* through *December*
    - Names of people and characters from history or mythology: *Elvis, Joan of Arc, Shakespeare, Einstein, Ms Puma, Superman, Hitler, Agatha Christie, Lincoln, Marshal McDillon*
    - Biblical names, places, and events: *God, Jesus, the Bible, Satan, Jerusalem, crucifixion, any of the saints*

- Titles of books, TV shows, movies, icons, etc.: *Gunsmoke, Yellow Brick Road, Leaves of Grass, Rosebud, Oscar, James Bond, Royal Ascot, the Bounty, Dodge City Horse Store*
- Names of famous horses: *Scout, Silver, Trigger, Northern Dancer, Seabiscuit, Blaze*
- You have to be careful about dropping corporate and product names into your lyrics these days, even if they're high-EPA. Every rapper under the sun does it (see www.AmericanBrandstand.com), so the practice has become tired and cliched, like the Truck Driver's Gear Change. As well, since the advent of paid corporate product placement in rap lyrics, the practice marks lyricists who drop product names in lyrics as cynical and unimaginative—even those who do it without corporate sponsorship.

"MOM, WHERE'S MY ORGASM?"

Corporations use high-EPA English-language words to name products. Some examples:

- Cosmetic shades of blush called "Orgasm" and "Deep Throat"
- Ice cream called "Chubby Hubby"
- Crayon colors called "Purple Heart" and "Razzmatazz"
- Juice drink called "Glacier Freeze"
- Nail polish called "Trailer Trash"

The emotion, or connotative meaning, associated with a word or product drives sales. One marketing consultant, Pam Danziger, came up with the following formula to illustrate the magnitude of emotion as a factor in making a buying decision:

$$\mathbf{P} = (\mathbf{N} + \mathbf{F} + \mathbf{A})\,\mathbf{E}^2$$

where **P** = Propensity to buy
N = Need for the product
F = Desirable features
A = Affordability
E = Emotion (*squared* to indicate relative importance)

The names of a corporation's products, if they become widely known, become high-EPA words—"Coke," for example (more on Coke in Chapter 12).

This even applies to words made up from scratch, such as "Kodak," a word that did not exist in anybody's vocabulary until it was invented and introduced as a corporate brand. However, this only happens if the corporation has the enormous marketing power required to associate a meaningless made-up word with a popular product. That's why, when you're creating a stage name for yourself, it's wise to avoid concocted names.

Watch out for word endings that turn verbs into nouns:

-ing: *building*
-ation: *colonization*
-ment: *enthralment*
-al: *betrayal*

Use the verb form if you can: *build, colonize, enthral, betray*

EXCEPTION: Some endings added to verbs turn verbs into people. Use 'em! (More on this in Section 10.5.)

-er: *waiter, writer, killer*
-or: *sailor, actor, emperor*

Adverbs

Adverbs convey three kinds of information:

- ***Degree, method, or manner:*** *very, seriously, quickly, carefully, awfully, truly* etc.
- ***Place:*** *here, somewhere, there, where/wherever, around,* etc.
- ***Time:*** *yesterday, today, tomorrow, ever, lately, soon, never,* etc.

Use adverbs of *place* and *time* to orient your listener. Here's a list of time-orienting adverbs and adverb phrases:

after/afterwards
ago
all night
already
any day
at dawn
at first light
at last
at long last
at night
at noon
at sundown
at sunrise
at the break of dawn
at the same time
awhile
before
before long
before noon
behind time
by and by
by night
by this time
constantly
day after day
day by day
early
endlessly
eternally
even now
eventually
every day
finally
first
for a time/long time
for the moment
for the time being
forever
from day to day
from now on
immediately
in autumn/fall spring/summer/winter
in future
in good time
in January/Feb., etc.
in no time
in the end
in the evening
in the long run
in the meantime
in the nick of time
in the past
in time
just in time
later
long ago
meanwhile
next/day/month/year
now
now and then
o'clock
often
once
once upon a time
on Monday, Tues, etc.
one day
one fine day
one fine morning
quickly
recently
right away
since
so far
soon
suddenly
the whole night
then
then and there
this day
till now
time was
today
tomorrow
tonight
too late
too soon
until now
whenever
yesterday
yet

Try to avoid using adverbs of *degree, method, or manner* (such as *very*)—adverbs that do not refer to time or place. That's about 99% of all adverbs. Sometimes they're useful, but often they weaken creative writing, including lyric writing.

Adjectives

You'll find adjectives more useful than adverbs. But don't go nuts with 'em. Focus on action verbs, nouns, and pronouns that refer to people.

If you stick the article *the,* or a possessive pronoun in front of an adjective, you can turn it into a noun that refers to people:

the lucky *the guilty* *my precious*

And you can add *-er/-est*, or *more/most* to create comparative and superlative degrees:

the luckier *the guiltiest* *my most precious*

Prepositions

Like some adverbs, prepositions serve as function-words to orient a listener in time and place. They also express relationships of belonging. Here are some useful common prepositions:

about	behind	during	off	to
above	below	except	on	towards
across	beneath	for	out of	under
after	beside	from	outside	underneath
against	besides	in	over	until
along	between	inside	past	up
among	beyond	into	round	upon
around	but (except)	like	since	with
at	by	near	through	within
before	down	of	till	without

10.3.3 COMING UP: 10 POWERFUL LYRICAL TECHNIQUES YOU CAN USE IN SONGS WITH MELODIES, AND IN RAP

All 10 of the techniques discussed in the next 10 sections apply as much to rap lyrics as they do to lyrics with melodies. Same goes for the suggested approach to composing lyrics coming up in Section 10.14.

So, if you're into rap lyric writing, you'll find everything that follows useful.

On a continuum from poetry read silently to lyrics sung to a melody, rap has a lot more in common with lyrics sung to a melody:

Poetry Read Silently:	**Poetry Read Aloud:**	**Lyrics Rapped:**	**Lyrics Sung:**
rhymed or unrhymed	rhymed or unrhymed, read to an audience	richly rhymed poetry, rapped with mainly rhythmic accompaniment	rhymed poetry set to melody, sung with harmonic and rhythmic accompaniment

Apart from the melodic aspect, rap lyrics differ from lyrics sung to a melody in two important ways (technically speaking):

1. ***Number of words.*** A rap lyric typically has many more words than a non-rap lyric (see Section 10.9).

2. ***Rhyme.*** A rap lyric typically has proportionally far more rhyme than a non-rap lyric (see Section 10.11).

10.4
10 Techniques for Creating Emotionally Powerful Lyrics (#1): Use Four Essential Tools

As discussed in Chapter 9, two tools (aside from this book) will help you write great original tunes consistently: a small digital recorder, and a metronome.

As an English-language lyricist, whether you write words for melodies, or rap rhymes, four tools will help you write great original lyrics consistently.

1. A Dictionary

Any reputable college-level desktop-type dictionary no more than six to eight years old will suffice. Or, you can use any of several good ones on the Web, such www.m-w.com. You don't need to get a new dictionary every year because you will not need to refer to your dictionary often. The words you use for your tunes or raps will be the kinds of words practically everybody knows. Except the latest slang or buzz words, which quickly date lyrics.

2. A Rhyming Dictionary or Two

Again, any reasonably comprehensive one will do. And again, the Web has many free ones. Just type "rhyming dictionary" into Google.

3. *The Elements of Style*, by Strunk and White

If you don't have Strunk and White's short style Bible, get it and study it to death. It's been around since 1918, revised and updated many times. In less than a hundred pages, Strunk and White will teach you more about effective English composition and style than a hundred weighty tomes on the craft of writing. Get the latest edition, the one with the foreword by Roger Angell.

4. *Roget's International Thesaurus, 6th Edition,* edited by Barbara Ann Kipfer

For lyricists, *Roget's International Thesaurus*, "*RIT*," is even more useful than Strunk and White. As you'll see later in this chapter, you'll be using *RIT* extensively for a purpose other than looking up synonyms. *RIT* has special organizational properties that make it far more useful than a mere synonym-finding appliance.

If you already have a thesaurus and it ain't *RIT*, get rid of it. Put it in the recycling bag, or give it to somebody who has no interest in creative writing.

Also, watch out for other thesauruses with the name "Roget" in their titles. There are many on the market. ***Do not get any of them.*** *RIT* is the only English language thesaurus in the world worth owning and using.

> **As a lyricist, once you learn how to take advantage of its unique characteristics (Section 10.14), *RIT* will be your single most valuable tool.**

The latest edition of *RIT* has 1,248 pages, paperback or hardcover, modestly priced.

10.5
10 Techniques for Creating Emotionally Powerful Lyrics (#2): Use a High Proportion of Personal Words

> Don't write about people; write about a person.
> —E. B. WHITE (paraphrased)

10.5.1
FLESCH'S "PERSONAL WORDS" INDEX

Listeners find phrases and sentences that refer to people more interesting than phrases and sentences without people. As soon as you put a noun or pronoun that

refers to a person in the same phrase as an action verb (not a linking verb), you have a character in action, *an event*. Do it several times, and you have the makings of a *story*, which is simply a sequence of events.

The Austrian-American communications scholar, Rudolph Flesch made his name as a developer of readability and reading-interest scales. Here's one simple but effective Flesch measure of how interesting your lyric-writing is: just count the number of references to people—"personal words"—in your lyric (including repeats) and divide it by the total number of words in the lyric (including repeats). The higher the percentage, the more interesting your lyric.

Words that count as "personal" words:

1. ***Named characters,*** both named people and named animals

2. ***Masculine and feminine people-nouns*** such as *boy, girl, man, woman, guy, wife, husband, sister, brother, father, mother, aunt, uncle, actress, queen, king, princess, prince, baron, countess,* etc.

3. ***Personal pronouns***—not *it*, and not *they* or *them* if they don't refer to people

4. ***Collective people-nouns***, such as these:

army	*class*	*expedition*	*group*	*people*
audience	*congregation*	*family*	*mob*	*public*
band	*crew*	*folks*	*pack*	*team*
choir	*crowd*	*gang*	*party*	*tribe*

Personal words tend to have high-EPA values. If the proportion of personal words in your lyric reaches at least 10% of all the words, it's probably a pretty interesting lyric. At 15% or higher, your lyric will probably be intensely interesting, especially if you've used a *named* character or two or three. Name your characters whenever you can. It's more effective than using personal pronouns. Doc Yada-Yadams, a fully qualified neurosurgeon with a moonshine problem, fully endorses this concept. So does Deputy Fester, now that all his hanging around the Dodge City Horse Store has paid off, what with Ellie Sue and all.

The number of *different* characters in a lyric also matters. Most lyrics have two characters—"you" and "I." Sometimes that's enough, but you can usually make a lyric more interesting with three or more characters.

Other people-words, worth considering, especially if linked to named characters or personal pronouns, are words that refer to people but are technically gender neutral: *lover, baby, pilot, strangler, doctor*. Some of these character-naming words, while inherently neither masculine nor feminine, would usually summon either a male or female character to mind. For example, most people would likely think of "strangler" as masculine. As well, many such character-naming words have inherently high EPA values.

10.5.2
PERSONAL PRONOUNS

The pronoun *it* does not refer to a person. *They* and *them* sometimes do, but not always. You'll find the following pronouns effective because they always refer to people (or horses):

I me we us you he him she her

Reflexive/Emphatic

Use reflexive and emphatic pronouns that refer to people: *myself ourselves yourself yourselves himself herself themselves*

Reflexive: the subject is acting upon himself or herself: *She saved herself.*
Emphatic: *You yourself said so.*

Indefinite

anyone anybody everyone everybody someone somebody no one nobody

Reciprocal

each other one another

Possessive

mine ours yours his hers theirs

Personal Pronouns In Contractions

Contractions make lyrics sound less formal, more conversational. So by all means, use personal pronouns in contractions:

I'm I've I'll I'd you're you've you'll you'd she's she'll she'd he's he'll he'd we're we've we'll we'd let's who's (and usually *they're they've they'll they'd*)

HE SAID, SHE SAID—AND YOU COULD TELL!

A team of researchers examined a sample of documents consisting of 25% of the entire British National Corpus (BNC), a 100-million-word database of samples of spoken and written English. They were looking for evidence of differences in word usage between male and female authors.

Exactly half of the BNC documents the team studied were male-authored, half female-authored, with fiction and non-fiction represented equally in both groups. All documents were written after 1960.

The findings of the study revealed statistically significant differences between men and women in the use of both content- and function-words, in both fiction and non-fiction. Main findings:

- Men tend to prefer words that identify the properties of objects and things, and the number of objects and things: *a, the, that, two, more*
- Women tend to prefer words that indicate relationships: *for, in, and, with*
- Men tend to prefer impersonal and plural pronouns: *those, these, they, this, that*
- Women tend to prefer personal and singular pronouns, such as *I, you, he, she, himself, herself*
- Men tend to prefer non-gender-encoding pronouns, especially *it*
- Women tend to prefer gender-encoding pronouns: *he, she,* etc.

These findings led the researchers to develop a software program that they claim can tell, with approximately 70 to 80% accuracy, whether an unknown piece of writing was written by a male or female. It's called the "Gender Genie," and it's located here:

www.Bookblog.net/Gender/Genie.html

10.6
10 Techniques for Creating Emotionally Powerful Lyrics (#3): Use a High Proportion of Personal Sentences

10.6.1
FLESCH'S "PERSONAL SENTENCES" INDEX

"Personal sentences" are conversational sentences, the kinds of sentences you find in lively fiction, but hardly ever in scientific and technical writing. Rudolf Flesch defines them as follows:

1. ***Dialogue***, set off by *he said* or *she said*. Think twice about using any dialogue attribution other than *said*. Don't say, *"I have a secret," she smiled.* And, for heaven's sake, don't tack on an adverb of degree or manner: *"I have a secret," she smiled, knowingly.*

2. ***Questions.*** If you start a sentence with *am, is, are, was,* or *were*, you have a question. This is one way you can get those otherwise feeble copula verbs to do something worthwhile. In general, if you can find a way to express a thought or idea in the form of a question, do it:

   Are you lonesome tonight?
   Is that all there is?
   Brother, can you spare a dime?
   Caledonia, what makes your big head so hard?
   Can your pussy do the dog?
   Do you know the way to San Jose?
   What was it you wanted?
   What's it all about, Alfie?
   They shoot horses, don't they?

Here's a list of words that start questions:

ain't	didn't	have	mustn't	whatever	who'll
am	do	haven't	shall	when	who's
are	does	how	should	whenever	whoever
aren't	doesn't	is	shouldn't	where	whose
can	don't	isn't	was	wherever	why
can't	had	may	wasn't	which	will
could	hadn't	might	were	whichever	won't
couldn't	has	mightn't	weren't	who	would
did	hasn't	must	what	who'd	wouldn't

3. ***Commands.*** If you *start a sentence with an action verb,* or an adverb of time or place followed by an action verb, you have a command, an imperative sentence. And if you include a personal word, you have an *event of human interest,* like some of these examples:

   Don't blame me.
   Express yourself.
   Fly me to the moon.
   Get out of town.
   Get up, stand up.
   Gimme shelter.
   Meet me in St. Louis, Louis.
   Never leave me alone.

4. ***Exclamations.*** Consider a sentence or phrase as exclamatory if it would likely end in an exclamation mark as part of a story in print:

   What a wonderful world!
   This is it!
   Hallelujah!
   Help!
   Music, music, music!
   Stop! in the name of love.
   Woo hah! Got you all in check.

5. ***Grammatically incomplete sentences*** that are meaningful in context. A sentence fragment lacks a verb, which is unexpected. So it gets attention:

   Jambalaya, a-crawfish pie and a-file gumbo.
   All or nothing at all.
   Big hat, no cattle.
   Oh lordy, trouble so hard.

The more sentences of the five varieties listed above, the more interesting listeners will find your lyric. In good dramatic writing, ***50% or more of all sentences are personal sentences,*** as defined above.

If your proportion of personal sentences is lower than 50%, your lyrics will still have high human interest if your use of personal words exceeds 15% of total words.

10.6.2 AVOID FORMALITY TO IMPROVE LISTENER COMPREHENSION

Once more, it's about *hearing* lyrics, not reading them. The more you can make your lyrics sound informal and conversational, the more easily your listeners will comprehend what you're saying.

Here are some ways to avoid formality and improve listener comprehension:

- ***Keep your sentences short.*** For all the rhyme and repetition, lyrics are still comprised of *sentences*, with subjects and predicates. Plus sentence fragments.

  In general, the shorter your sentences, *on average*, the better. Once again, listeners *hear* lyrics. If they don't get what you're saying the first time around, because a sentence is long and convoluted, they can't go back and re-read the sentence. They have to listen to the song again—if they feel like it.

  Try to keep your sentences to 10 words or fewer, unless you're constructing easy-to-comprehend parallel phrases that comprise a long sentence (see Section 10.10).

- ***Use familiar words and phrases.*** For instance, don't say *motor vessel* when you mean *motor boat* or *speedboat.*

- ***Use contractions.*** Section 10.5.2 lists contractions formed with personal pronouns. Here are some additional common and useful contractions:

  aren't isn't wasn't weren't haven't hasn't hadn't won't wouldn't shouldn't can't couldn't mustn't don't doesn't didn't here's there's where's how's what's

10.7
10 Techniques for Creating Emotionally Powerful Lyrics (#4): Prefer Concrete Symbols and Imagery to Abstract Ideas and Concepts

"Show, don't tell." That's the first thing every creative writing instructor teaches. But what does "show" mean?

It means, "Give me an example that I can see or experience with one or more of my five senses."

Like all primates, you as a human take in most information about the world visually. Keen stereoscopic vision enables you to perceive an object's size, color, distance, speed, direction of motion and so on.

Your brain finds it a lot easier to recall faces than names. It's the difference between recognition (faces) and recall (names).

- ***Recognition.*** When you use concrete visual imagery in language, the words you use trigger the activation of visual neuronal representations, which your listeners' brains *recognize* and bring to mind with ease.

- ***Recall.*** If you use words that represent abstract ideas and concepts, no such imagery comes to mind. Therefore, your listeners' brains have to do a lot more work, *recalling* what the words mean, instead of simply recognizing images.

There's no hard-and-fast definition of what makes a noun abstract versus what makes it concrete. Degrees of abstractness and concreteness form a continuum, something like this:

ABSTRACT				**CONCRETE**
food	produce	vegetable	mushroom	portobello
artist	musician	pop musician	songwriter	John Lennon
literature	publication	book	novel	*Ulysses*
organism	animal	mammal	horse	Seabiscuit
clothing	headgear	hat	cowboy hat	ten gallon Stetson

You could argue that *food* is concrete. You can see *food*. Same with *clothing* or *artist*. But, as the above list shows, it's easy to name examples of food that are *more* concrete than *food*.

If you keep asking of a noun, "What's an example?" you can get more and more specifically concrete.

"What's an example of *food*?"
"*Produce*."
"What's an example of *produce?*"
"*Vegetables*."
"What's an example of a *vegetable?*"
"A *mushroom*."
"What's an example of a *mushroom?*"
"A *portobello mushroom*."
"What's an example of a *portobello mushroom?*"
"Get stuffed."

As you get more and more concrete, your listeners find it easier and easier to grasp what the lyric's about:

person *man* *my man* *Carlos*

Concrete nouns paint vivid pictures, to be sure (*ten gallon hat*). But concrete nouns, together with related verbs and adjectives, can also serve as symbols to make available to the five senses ideas and emotions that could not otherwise be expressed:

Oh you're in my blood like holy wine
You taste so bitter and so sweet
Oh I could drink a case of you
And I would still be on my feet
I'd still be on my feet
—JONI MITCHELL ("A Case Of You")

That works a lot better than trying to express abstract ideas and emotions directly, without enlisting the senses. If she didn't know what she was doing when she was writing "A Case of You," Joni Mitchell probably would have come up with drivel such as this (and no one would ever have heard of her):

"I Still Have Strong Feelings For You"

I want you to know how strong
My feelings of love are for you
Even though sometimes we don't get along
I still have strong feelings for you
Yes, I still have strong feelings for you

("Stop! Stop!")

It just says exactly what it says, in a dead boring way. It doesn't show the listener anything, not visually, not by taste, touch, smell, or sound.

If you do not use concrete, specific words symbolically and figuratively, you will never create powerful new experiences for listeners.

10.8
10 Techniques for Creating Emotionally Powerful Lyrics (#5): Sail Beyond the Horizon of Logic and the Real World—But Use the Wundt Curve to Chart Your Way

> The greatest thing by far is to have a command of metaphor ... To make good metaphors implies an eye for resemblances.
>
> —ARISTOTLE

In the real world, everybody expects everybody else to behave reasonably and to use literal language. For the most part, that's what everybody does, in the real world. The day-to-day predictable real world.

But art is not the real world. Neuroscientist and investigator of artistic phenomena, V. S. Ramachandran:

> Art has nothing to do with realism. It is not about creating a replica of what's out there in the world. I can take a realistic photograph of my cat and no one would give me a penny for it. In fact, art is not about realism at all—it's about the exact opposite. It involves deliberate hyperbole, exaggeration, even distortion, in order to create pleasing effects in the brain.

In metaphor, simile, allegory, personification and other figures of speech, two things are compared, explicitly or implicitly, implying a resemblance. At least one referent in the comparison is concrete and instantly recognizable. (Often both are concrete.) It occurs out of its "normal" context. So it surprises the reader or listener, triggering an emotional response and providing insight about something that could not otherwise be expressed. When you use high-EPA words, you create big surprises and intense emotional responses.

You cannot accurately translate metaphorical language into "plain English" any more easily than you could accurately translate a poem in another language into plain English. "Poetry," as Robert Frost famously observed, "is what gets lost in translation."

Language rich in high-EPA concrete symbols and metaphorical comparisons tends to stick around. The more visual and surprising the metaphor, the more compelling, and the more likely it is to stick in memory.

EASY MONEY! SHOW 'EM YOUR PARANORMAL POWER ... COLLECT $1 MILLION!

The human brain has the uncanny ability to make linkages between unrelated things. That's why simile and metaphor work so well.

It's also why people believe the claims of astrologers, psychics, faith healers, etc. Alas, many such practitioners of the paranormal have tried, without success, to earn the $1 million cash prize on permanent offer by the James Randi Educational Foundation, available to any human being who can "show, under proper observing conditions, evidence of any paranormal, supernatural, or occult power or event." The foundation does not carry out the testing procedure. See www.Randi.org

If you don't have the courage to venture beyond the lowest level, the denotative or literal meanings of words and phrases, you won't write lyrics that anyone would consider art. And few will remember them unless they're associated with brilliant

music or a charismatic performer. Instead, you will write pedestrian, forgettable lyrics much like "I Still Have Strong Feelings for You," from Section 10.7.

Or equally pedestrian lyrics such as these:

I want to be your fantasy
And be your reality
And everything in between
I want you to need me
Like the air you breathe
I want you to feel me
In everything
I want you to see me
In your every dream
—DIANE WARREN, recorded by CELINE DION ("I Want You To Need Me")

All is fair in love
Love's a crazy game
Two people vow to stay
In love as one they say
But all is changed in time
The future none can see
—STEVIE WONDER ("All In Love Is Fair")

You don't have to be afraid of what you are
There's an answer
If you reach into your soul
And the sorrow that you know
Will melt away
—MARIAH CAREY & WALTER AFANASIEFF ("Hero")

Lyrics don't get much more generic, abstract, philosophical—and boring. Perfect for computer-programmed mainstream radio playlists and charismatic superstar performers—which is why such songs sell millions (see Chapter 12), even though the lyrics present nothing remotely interesting or intriguing to the listener. Boring and predictable. Extreme left side of the Wundt curve.

In 2003, researchers at the University of Colorado published a content analysis of "the 100 most popular songs (1958-1998) for artistic characteristics and expression of love." They found that, over time, songwriters have replaced references to love with references to sex and selfishness. They concluded that, "the expression of love may have changed as the culture has become more individualistic."

Whether writing about love in terms of romance or in terms of sexual gratification, many songwriters think you *have* to write Generic Artless Relationship Lyrics such as the above, because it's the chart hit formula, and it's the only way to succeed as a songwriter.

Not true. If you're ever in doubt that you can succeed without defaulting to the omnipresent and nauseating Generic Artless Relationship Lyric, flip through a copy of *The Green Book of Songs by Subject Matter* (see References).

To write great lyrics, you have to take risks. You have to use symbolism and figurative language, especially simile and metaphor that's rich in concrete imagery—especially visual imagery.

Suppose you start with a couple of lines that mean exactly what they say:

The moon moves slowly
Across the dark sky

The image becomes more interesting when you compare the moon to a ship, a simile poets have used for millennia:

The moon like a ship
Sails a dark sea

It gets more humanly interesting when personification imbues the moon with human qualities:

The moon's like a ship
She sails a dark sea

But never mind the dang moon. Make the subject human. Keep the ship, but make it a clearer ship and a more specific ocean—metaphors that show something about the subject. Introduce another character or two, use techniques such as more personal words, a personal sentence, parallel construction (see Section 10.10) ...

Cassandra's a tall ship
She sails a black ocean
She sails her king's ocean
Who sails her king's body?

The Wundt curve applies as much when writing lyrics as it does when writing music. In lyric-writing:

- Far left side = too literal and matter-of-fact = predictable and boring
- Far right side = too scattered and convoluted = confusing and inaccessible

What you say has to make enough sense that it doesn't sound like the deranged ramblings of the village idiot, riding off in all directions (right side of the Wundt curve). But not so much sense that it amounts to dull, predictable rhymed doggerel.

Below are lyrical excerpts from a variety of outstanding and successful songs.

- They don't sound completely reasonable, but they make enough sense to be comprehensible.

- With figurative language and concrete imagery, they capture the listener's attention and engage the listener emotionally.

You can write lyrics of this quality if you learn effective lyrical technique and apply some imagination:

Hark now, hear the sailor's cry
Smell the sea and feel the sky
Let your soul and spirit fly into the mystic
And when that foghorn blows
I will be coming home
—VAN MORRISON ("Into The Mystic")

I'm a fountain of blood
In the shape of a girl
You're the bird on the brim
Hypnotised by the whirl
Drink me, make me feel real
Wet your beak in the stream
—BJORK ("Bachelorette")

I take it higher like a bird on a wire, retire the fire
I never, 'cause I'm just movin' on up
Choosin' to touch the unseen, cravin' to clutch
The most inevitable, legible pyromania
Slaying the devil and sendin' him back to Transylvania
—K-OS ("Crabbuckit")

Words can be like weapons
No matter that they're small
And I used three tiny words on you
And then beat it down the hall
Does this road go on forever?
Does this terror know no end
For a girl on a road?
—FERRON ("Girl On A Road")

Ransom notes keep falling from your mouth
—IMOGEN HEAP ("Hide And Seek")

The moon so long has been gazing down
On the wayward ways of this wayward town
Her smile becomes a smirk
I go to work
Love for sale
—COLE PORTER ("Love For Sale")

I even got a tattoo of your name across the chest
Sometimes I even cut myself to see how much it bleeds
It's like adrenaline, the pain is such a sudden rush for me
—EMINEM ("Stan")

Strumming my pain with his fingers
Singing my life with his words
Killing me softly with his song
Killing me softly with his song
—N. GIMBEL & C. FOX, recorded by ROBERTA FLACK; THE FUGEES ("Killing Me Softly With His Song")

Elvis are you out there somewhere
Looking like a happy man
In the snow with Rosebud
And king of the mountain?
—KATE BUSH ("King Of The Mountain")

These shabby shoes I'm wearin' all the time
Are full of holes and nails
And brother if I stepped on a worn out dime
I bet a nickel I could tell if it was heads or tails ...
No matter how I struggle and strive
I'll never get out of this world alive
—HANK WILLIAMS, SR. & FRED ROSE ("I'll Never Get Out Of This World Alive")

Jesus, take the wheel
Take it from my hands
'Cause I can't do this on my own
I'm letting go
So give me one more chance
To save me from this road I'm on
Jesus, take the wheel
—BRETT JAMES, HILLARY LINDSEY, GORDIE SAMPSON and JONATHAN YUDKIN, recorded by CARRIE UNDERWOOD ("Jesus Take The Wheel")

Like a bridge over troubled water
I will lay me down
—PAUL SIMON ("Bridge Over Troubled Water")

Now I'm in the limelight 'cause I rhyme tight
Time to get paid, blow up like the World Trade
Born sinner, the opposite of a winner
Remember when I used to eat sardines for dinner?
—THE NOTORIOUS B. I. G., P. DIDDY, J. MTUME, & J. C. OLIVIER, recorded by THE NOTORIOUS B. I. G. ("Juicy")

Isn't it rich? Are we a pair?
Me here at last on the ground, you in mid-air
Send in the clowns
—STEPHEN SONDHEIM ("Send In The Clowns")

Ah, the silver knives are flashing in the tired old café
A ghost climbs on the table in a bridal negligee
She says my body is the light, my body is the way
I raise my arm against it all and I catch the bride's bouquet
—LEONARD COHEN ("The Gypsy's Wife")

I'll shoot the moon right out of the sky for you, baby
I'll be the pennies on your eyes for you, baby
—TOM WAITS ("I'll Shoot The Moon")

10.9
10 Techniques for Creating Emotionally Powerful Lyrics (#6): Know How to Proportion Unique Content-words, Function-words, and Repeated Words

Function-words comprise a surprisingly large proportion of all the words in a lyric because many of the common ones (*a, an, the, or, in, if, on, by, to, it, that,* etc.) get repeated.

Which raises the question, how much repetition does a great lyric have?

Consider the group of 16 songs from Section 9.5.3 as a more or less representative sample of great popular songs. Suppose you remove Beck's "Loser" because, as a rap lyric, it has properties that set it apart from lyrics set to melodies (more on this in a minute).

Count the number of content-words, function-words, and repeated words in the remaining 15 lyrics. If you then do some basic statistics, you get the following average percentages (rounded) of word categories for a lyric (Figure 135):

FIGURE 135 Average Proportions of Content-words, Function-words, and Repeated Words in a Great Lyric

Unique Content-words	Unique Function-words	Repeated Words (Content & Function)
70 ± 10 words 38%	12 ± 2 words 7%	100 ± 18 words 55%

Total words: 182 ± 20 words

The sample is small, but for illustrative purposes, it'll do. In the sample, the proportions of unique content-words, unique function-words, and repeated words are remarkably similar from lyric to lyric. For example, the number of unique content-words exceeds 50% in only two of the 15 lyrics. The odds are pretty good that if you drew a large sample from the *Gold Standard Song List* and did the same analysis, you'd come up with similar proportions of word categories.

Two things to bear in mind from these findings:

1. Excluding rap, a great lyric has, on average, only a few dozen content-words—only 60 to 80 in this sample. If you want to write effective lyrics, you don't have a whole lot of words to say everything you want to say. You have to make every word count. More on this in Section 10.14.

2. As for all that repetition—55% of all the words in a typical lyric ... is that simply the chorus repeating over and over?

   Sometimes.

   But lots of great songs, including raps, don't have a chorus. That's where parallel construction comes in.

Before moving on to parallel construction, a word about rap lyrics. An analysis of a sample of great rap songs of the 1980s, 1990s, and 2000s shows that the sheer number of words in a rap lyric averages about 620 (± 80), including repeats, or

almost 3.5 times the average number of words in a lyric set to a melody. This has huge implications with respect to rhyme (Section 10.11) and the process of composing outstanding original rap songs (Section 10.12 and 10.14).

10.10 10 Techniques for Creating Emotionally Powerful Lyrics (#7): Live for Parallel Construction, Die for Parallel Construction

10.10.1 DIFFERENCES BETWEEN MUSICAL AND LYRICAL STRUCTURAL UNITS

In prose, the basic structural unit is the paragraph. In songwriting, verses, choruses, and middle eights are basic lyrical structural units. That is, each lyrical verse, chorus, or middle eight functions as a meaningful unit of thought, the way the paragraph does in prose.

However, these lyrical structural units do not usually match musical structural units.

- ***Musical structural units.*** When composing music, you have to think in terms of small structural units, namely, phrases and periods (especially periods). These structural units will take on whatever form they take, be it four-bar units, eight-bar units, or some other size.

- ***Lyrical structural units.*** When composing lyrics, you have to think in terms of verses, choruses, and middle eights. In lyrical composition, verses and choruses will take on whatever form they take, be it four-*line* units, six-*line* units, eight-*line* units, or whatever.

More often than not, lyrical structural units are considerably *larger* than musical structural units. For example, a single lyrical verse will end up in a musical setting comprised of two musical periods—four structural phrases.

A common error of aspiring songwriters is to assume that lyrics and music have, or ought to have, the same basic unit of composition. It's important to understand that they usually don't. It takes some practice and skill to reconcile the two.

A verse (the equivalent of a *stanza* in poetry) repeats rhyme schemes and typically shows parallel structure. Once you settle on a structure for the verse, it works best to repeat that lyrical structure *exactly* (or as close to exactly as you can) in subsequent iterations.

The middle eight usually does not repeat and is therefore the least memory-friendly and the least likely to be remembered on first listening. But it serves an important purpose: structurally speaking, it pulls the lyric from the left side of the Wundt curve towards the top by introducing variety.

10.10.2 PARALLEL CONSTRUCTION FOR EMPHASIS AND MEMORABILITY

Recall that, because a song unfolds in time, not space, the song has to reveal structure on the fly, using mnemonic devices. From a lyrical standpoint, chorus-repetition is one such device. Rhyme is another (see Section 10.11). A third is parallel construction, a less blatant form of repetition than repeating a chorus.

Parallel construction is just as important for creating lyrical structure and cohesion as are chorus-repetition and rhyme. Like chorus-repetition and rhyme, parallel construction creates emphasis and makes whole groups of lines much easier for the listener to comprehend and remember.

Parallel construction is the lyrical equivalent of the musical sequence in the sense that there's repetition, but it's not (usually) exact. Also, lyrical parallel construction and the musical sequence are not related *to each other*. That is, just because you write lyric lines in parallel, that does not mean you have to match them to musical sequences. And vice-versa. Sometimes the two just happen to go well together, but there's no natural relationship.

Technically, parallel construction refers to wording that repeats at the beginning, in the middle, or at the end of several consecutive lines. In lyric-writing, however, you'll find it useful to distinguish between two kinds of parallel construction:

- Parallel construction from verse to verse or and chorus to chorus
- Parallel construction *within* a verse or chorus

10.10.3 PARALLEL CONSTRUCTION, VERSE TO VERSE, CHORUS TO CHORUS

A chorus is a multi-line structural unit that repeats more or less exactly after each verse or two. If you think of a verse (or pair of verses) followed by a chorus as a "macro" lyrical unit, then the chorus repeats at the end of the macro unit. The chorus, then, functions as a unit of parallel construction with respect to the whole song. The middle eight adds variety by breaking up a pattern that could become too predictable.

Many songs don't have a chorus, just a series of verses. Often a middle eight, too. If you write a song with no chorus, try to make at least one phrase or line identical or similar in every verse. Fix the repeated phrase or line in the same spot from verse to verse. That repeated phrase or line functions as a chorus substitute.

Some examples of this common method of parallel construction:

- "Seven Nation Army" (The White Stripes) has three verses, no chorus, and no middle eight. But the last line of each verse (first and last lines are emphatic positions) shows parallel construction. Moreover, the last lines in verses one, two, and three all rhyme. Here they are:

  And the message coming from my eyes says leave it alone
  And the feeling coming from my bones says find a home
  And the stains coming from my blood tell me go back home

  If that weren't enough, "Seven Nation Army" promotes Wichita as a vacation paradise. As though Dodge city is chopped liver.

- "The First Time Ever I Saw Your Face," composed and recorded by Ewan MacColl, has been covered by everyone under the sun, including Roberta Flack, Elvis Presley, Gordon Lightfoot, Johnny Cash, and George Michael. The song has no chorus, no middle eight, and three verses (in some recorded renditions, the first verse is repeated). This time, the *first* line of each verse reveals parallel construction:

  The first time ever I saw your face
  The first time ever I kissed your mouth
  The first time ever I lay with you

- Same thing with Bob Dylan's "Political World." No chorus, no middle eight, but 11 verses (short ones!). Each verse *begins* with the same line,

  We live in a political world

- You'll find parallel construction everywhere in Lennon-McCartney lyrics. In double middle-eights. In verses of songs that have choruses. And in verses of songs without choruses, such as these:

  - "And I Love Her" has no chorus, three verses (one of which is repeated), and a middle eight. The title phrase repeats at the end of each verse.

  - "When I'm Sixty-four" has no chorus, three verses and two, count 'em, two middle eights—not uncommon in Lennon-McCartney songs. The line, *Will you still need me, will you still feed me, when I'm sixty-four* repeats at the end of each verse.

  Massive parallel construction in Lennon-McCartney lyrics is one of the main reasons they're so catchy and memorable.

10.10.4 PARALLEL CONSTRUCTION WITHIN A VERSE OR CHORUS

Parallel construction *within* a verse can be extraordinarily effective. It has a spell-binding quality:

> *And who in her lonely slip?*
> *Who by barbiturate?*
> *Who in these realms of love?*
> *Who by something blunt?*
> *Who by avalanche?*
> *Who by powder?*
> *Who for his greed?*
> *Who for his hunger?*
> *And who shall I say is calling?*
> —LEONARD COHEN ("Who By Fire")

Here's a less profound but nonetheless effective example of parallel construction within a verse. This example uses "call-and-response" technique, common in gospel songs:

If I had a million dollars
(If I had a million dollars)
I'd buy you a house
(I would buy you a house)
If I had a million dollars
(If I had a million dollars)
I'd buy you furniture for your house
(Maybe a nice chesterfield or an ottoman)
If I had a million dollars
(If I had a million dollars)
I'd buy you a K-car
(a nice reliant automobile) ...
—STEVEN PAGE & ED ROBERTSON, recorded by BARENAKED LADIES ("If I Had $1,000,000")

As for parallel construction within a chorus, it's less common because the entire chorus repeats after each verse (or, sometimes, after two verses). When lines within the chorus repeat, it amounts to repetition of repetition:

When the pimp's in the crib, ma
Drop it like it's hot,
Drop it like it's hot
Drop it like it's hot
When the pigs try to get at ya
Park it like it's hot
Park it like it's hot
Park it like it's hot
And if a nigga get a attitude
Pop it like it's hot
Pop it like it's hot
Pop it like it's hot
—SNOOP DOGG, CHAD HUGO, & PHARRELL WILLIAMS, recorded by SNOOP DOGG & PHARRELL ("Drop It Like It's Hot")

In this example, lyrical parallel construction and musical sequence coincide:

And it's a hard
And it's a hard
It's a hard
And it's a hard
It's a hard rain's a-gonna fall
—BOB DYLAN ("A Hard Rain's A-gonna Fall")

Every verse of "Hard Rain" also makes use of parallel construction:

I saw a newborn baby with wild wolves all around it
I saw a highway of diamonds with nobody on it
I saw a black branch with blood that kept drippin'

I saw a room full of men with their hammers a-bleedin'
I saw a white ladder all covered with water
I saw ten thousand talkers whose tongues were all broken
I saw guns and sharp swords in the hands of young children

The more parallel construction within verses and choruses, the less need for end-rhyme because so much *identical rhyme* is "front-loaded," so to speak. More on this in Section 10.11.

10.10.5 PARALLEL CONSTRUCTION IN UNPARALLELED SPEECHES

Preachers and orators have always taken advantage of the power of parallel construction. You are no doubt familiar with Churchill's famous "We shall fight on the beaches" speech (June 4, 1940). Most people don't remember much about the rest of the speech, but everybody remembers this excerpt, at least in part:

We shall fight in France,
We shall fight on the seas and oceans,
We shall fight with growing confidence and growing strength in the air,
We shall defend our Island, whatever the cost may be,
We shall fight on the beaches,
We shall fight on the landing grounds,
We shall fight in the fields and in the streets,
We shall fight in the hills;
We shall never surrender.

In one of the most emotionally powerful speeches ever delivered, Martin Luther King, Jr. used parallel construction to breathtaking, overwhelming effect (August 28, 1963):

But one hundred years later, the Negro is still not free.
One hundred years later, the life of the Negro is still sadly crippled ...
One hundred years later, the Negro lives on a lonely island of poverty ...
One hundred years later, the Negro is still languished ...

Now is the time to make real the promises of democracy.
Now is the time to rise from the dark and desolate valley of segregation ...
Now is the time to lift our nation from the quicksands of racial injustice ...
Now is the time to make justice a reality for all of God's children.

We can never be satisfied as long as the Negro is the victim ...
We can never be satisfied as long as our bodies, heavy with the fatigue ...

We cannot be satisfied as long as the Negro's basic mobility ...
We can never be satisfied as long as long as our children ...
We cannot be satisfied as long as a Negro in Mississippi cannot vote ...
We will not be satisfied until justice rolls down like waters ...

Some of you have come here out of great trials and tribulations.
Some of you have come fresh from narrow jail cells.
Some of you have come from areas where your quest for freedom ...

Go back to Mississippi, go back to Alabama, go back to South Carolina, go back to Georgia, go back to Louisiana, go back to the slums and ghettos of our northern cities, knowing ...

I still have a dream. It is a dream deeply rooted in the American dream.
I have a dream that one day this nation will rise up ...
I have a dream that one day on the red hills of Georgia ...
I have a dream that one day even the state of Mississippi ...
I have a dream that my four children will one day live in a nation ...
I have a dream today.
I have a dream that one day down in Alabama ...
I have a dream today.
I have a dream that one day every valley shall be exalted ...

With this faith we will be able to hew out of the mountain of despair ...
With this faith we will be able to transform the jangling discords ...
With this faith we will be able to work together, to pray together, to struggle together, to go to jail together, to stand up for freedom together ...

And so let freedom ring from the prodigious hilltops of New Hampshire!
Let freedom ring from the mighty mountains of New York!
Let freedom ring from the heightening Alleghenies of Pennsylvania!
Let freedom ring from the snow-capped Rockies of Colorado!
Let freedom ring from the curvaceous slopes of California!
But not only that, let freedom ring from Stone Mountain of Georgia!
Let freedom ring from Lookout Mountain of Tennessee!
Let freedom ring from every hill and every molehill of Mississippi.
From every mountainside, let freedom ring.

Black men and white men, Jews and Gentiles, Protestants and Catholics ...

In the words of the old Negro spiritual, "Free at last! free at last! thank God Almighty, we are free at last!"

King's *I Have a Dream* speech embodies everything you need to learn about emotionally powerful writing:

- High-EPA word choice, including numerous evocative proper nouns

- Personal words
- Personal sentences
- Concrete symbolic imagery
- Figurative language, including *allusions* (and direct references) to the *Bible*, the *U. S. Constitution*, and Lincoln's *Gettysburg Address*
- Parallel construction and the identical rhyme that comes with it

It all adds up to, arguably, *the* single greatest speech of the 20th Century and probably the most brilliant speech ever delivered in the English language. If you want a printable copy to study (recommended), get it at:

http://DouglassArchives.org/IHaveADream.txt

10.11
10 Techniques for Creating Emotionally Powerful Lyrics (#8): Find Time to Rhyme

10.11.1
WHY SONG LYRICS—ESPECIALLY RAP LYRICS—*NEED* RHYME, BUT POEMS DON'T (NECESSARILY)

Rap is something you do; hip-hop is something you live.
—KRS-ONE

When a poet reads unrhymed poetry aloud, it often sounds to the listener as though the poet is reading mere flowery prose—a diatribe or a short story. All too often, that's all it is: a rant or story with sentences broken into short lines that form a vertical pattern down the page (transforming it into a "poem"), which the poet performs with appropriate histrionics.

In song lyrics—especially rap lyrics—rhyme plays a far more important role than it does in poetry. Lyricists have to write specifically for a *listening* audience, not a reading audience. Reading doesn't enter the picture unless a listener decides to read the CD insert, or goes lyric-hunting on the Internet.

When writing lyrics, short-term/working memory limitations apply to the hilt. Rhyme serves a couple of important—and related—functions:

- It helps make lyric lines memorable
- Like repetition and parallelism, rhyme creates structure

10.11.2 "TRUTH" IN RHYME

People not only remember rhymed lines more easily than unrhymed lines, but also *believe* rhymed lines more than unrhymed lines.

In a study in which participants were asked to rate the truthfulness or accuracy of aphorisms previously unknown to the participants, the aphorisms that rhymed always received higher accuracy ratings than those that did not rhyme—*even though there was no difference in meaning between the rhymed and unrhymed versions.* For example, "What sobriety conceals, alcohol reveals" was rated significantly more accurate than, "What sobriety conceals, alcohol unmasks."

The researchers explained that people base truthfulness or accuracy of information in part on "processing fluency"—the ease with which the brain can process the information. They concluded that "rhyme, like repetition, affords statements an enhancement in processing fluency that can be misattributed to heightened conviction about their truthfulness."

"YOU MUST SET FREE A CELEBRITY"

Defence attorney Johnny Cochran, virtuoso that he was, played the O. J. Simpson jury with admirable mastery. Knowing he was dealing with a stable of nodding donkeys, Cochran fed the jury the line, "If it doesn't fit, you must acquit." The members of the jury looked at each other and nodded. The line rhymed, so it had to be true, they reasoned.

When deliberation day arrived after an *eight month* trial, the jury grazed in the pasture for three whole hours, ignored overwhelming DNA evidence against Simpson, and returned a verdict of not guilty.

Perhaps the members of the jury also had in mind the rhyming aphorism, "You must set free a celebrity."

10.11.3 RHYME SCHEMES

To maximize memorability, most lyric lines rhyme at the earliest opportunity—in *couplets:* a a b b, etc. (end-of-line rhymes). Here's a typical example:

a *Now eleven million later, I was sitting at the bar*
a *I'd bought the house a double, and the waitress a new car*
b *Dwight Yoakam's in the corner, trying to catch my eye*
b *Lyle Lovett's right beside me with his hand upon my thigh*
—MARY CHAPIN CARPENTER & DON SCHLITZ ("I Feel Lucky")

(Incidentally, that bar in that song is none other than the Wrong Ranch Saloon in Dodge City. Sadie and Ellie Sue were both there and saw Ms Puma pour the drinks for Lyle Lovett, Dwight Yoakam and Mary Chapin Carpenter. Sadie tried to horn in on Mary Chapin's territory but didn't have much luck because Mary Chapin is a famous singer and Sadie is just part owner of the Dodge City Horse Store. Sadie reckoned Mr. Lovett would take a shine to her because he writes songs about horses, such as "Which Way Does That Old Pony Run?" But he was more interested in Mary Chapin. Sadie figures it's because he used to be married to Julia Roberts, and that spoiled him.)

Here's a typical example of rap lyrics rhyming in couplets (this example has lots of internal and other kinds of rhyme, discussed in the next section):

a Street professors, Terror Squad, ghetto scholars
a Full A Clips Squad, inflicts the fear of God when the metal hollers
b Better acknowledge or get knocked down until I'm locked and shot down
b Heather B couldn't make me put my Glock down
—BIG PUNISHER, FAT JOE, SNOOP DOGG, C. WOLFE & A. YOUNG, recorded by BIG PUNISHER FEAT. FAT JOE ("Twinz (Deep Cover)")

When you're trying to come up with rhyming couplets, you'll usually have one strong line, then have to think of another line with an end-word that rhymes. You can increase the impact of the couplet by positioning the more powerful of the two rhyming words at the end of the *second line* of the couplet, not at the end of the first line.

You can sometimes successfully pull off non-couplet rhyme schemes in lyrics. In this example, the first and last lines are near-rhymed; the middle lines are parallel-constructed and *identically-rhymed:*

a *My milkshake brings all the boys to the yard*
b *And they're like, it's better than yours;*
b *Damn right, it's better than yours.*
a *I could teach you, but I have to charge.*
—CHAD HUGO & PHARRELL WILLIAMS, recorded by KELIS ("Milkshake")

This example has a different, non-couplet rhyme scheme, a b a b:

a *We came to the pyramids all embedded in ice.*
b *He said, "There's a body I'm tryin' to find.*
a *If I carry it out, it'll bring a good price."*
b *It was then that I knew what he had on his mind.*
—BOB DYLAN ("Isis")

If you don't rhyme in couplets, you have to exercise some care. If you use an overly complex rhyme scheme, listeners might not pick up on it, and you'll lose the mnemonic and structural advantages of rhyme.

On the other hand, simple non-couplet rhyme schemes, such as those in the above examples, are unusual enough that they attract attention.

MONDEGREEN PARADISE: THE ARCHIVE OF MISHEARD LYRICS

The original misheard lyric went like this:

Actual Lyric	**Misheard As:**
They hae slain the Earl Amurray	They hae slain the Earl Amurray
And laid him on the green	And Lady Mondegreen

After that, misheard lyrics came to be known as mondegreens.

The most famous mondegreen in rock is the Hendrix line, "'Scuse me while I kiss the sky," which may *or may not* have been misheard as "'Scuse me while I kiss this guy."

Which inspired the domain name of **The Archive of Misheard Lyrics:**

www.KissThisGuy.com

Have fun!

10.11.4
KINDS OF RHYME

Dedicated rappers obsess about mastering all the varieties and flavours of rhyme. A justified obsession. ***In rap, rhyme functionally replaces melody.*** Rhyme is what the ear listens for and remembers. Which is why the greatest rappers have the best rhyme and rhythmic flow skills.

Scores of rhyme types have been identified—or at least *labels* for different types of rhyme. Many are just duplicate names for the same rhyme variant. And many apply to rhyme that only becomes apparent if you *read* it, as distinct from rhyme that's meant to be heard.

So, for a lyricist, memorizing and trying to make sense of every type of rhyme under the sun (amphisbaenic rhyme, caudate rhyme, hermaphrodite rhyme ...) would be a waste of time and an exercise in confusion and masochism.

What causes a lot of confusion about rhyme is that you can define the same pair of rhymed words or syllables in at least three different ways:

- By similarity of sound
- By syllable number and accent
- By rhyme location in a phrase or line

So, for example, you could describe a given pair of rhymed words or syllables as:

- True, feminine, internal rhyme
- Near, multi-syllable, end rhyme
- Identical, masculine, beginning rhyme

Numerous such combinations.

So, to clear up the confusion once and for all, here are 12 kinds of rhyme ya gotta know if ya wanna grow and flow like a pro.

10.11.5
RHYME BY SIMILARITY OF SOUND

1. True Rhyme, aka Full or Perfect Rhyme

In true rhyme, the last accented syllable of a word, and any *sounds* that follow, are identical (regardless of spelling) *except* the initial consonant of the last stressed syllable.

True rhymes:	*horse / course / force / divorce* *waiting / dating / confiscating / relating* *interference / incoherence*
Not true rhymes:	*horse / hoarse* (despite different spelling, this is *identical rhyme*) *liver / deliver* (initial consonant is the same; rhyme is identical) i*nterference / incoherent* (last consonant is not identical)

When you true-rhyme, listeners are apt to perceive truth or accuracy in your rhymes. However, you have a relatively small number of words that you can true-rhyme, which may restrict what you can say and how you can say it.

On the other hand, insisting on true rhyme may force you to think more imaginatively, enabling you to come up with lines that attract attention to your rhyming invention, not to mention comprehension.

2. Near Rhyme, aka Assonance, Vowel Rhyme, Imperfect Rhyme, Off Rhyme

There are no hard-and-fast rules about which of many labels for "not true" rhyme apply to the broad category of near rhyme. For practical purposes when writing lyrics, you can think of *assonance*, or *vowel rhyme*, as the main near-rhyme counterpart of true rhyme.

In popular music, the great lyricists of the first half of the 20th Century such as Irving Berlin, Cole Porter, Sammy Cahn, Ira Gershwin, Lorenz Hart, Oscar Hammerstein II, and Johnny Mercer almost always rhymed true rather than near. From the1960s on, with the rise of songwriters as solo performers and members of bands, near rhyme became much more common, especially vowel rhyme.

With the advent of rap in the late 1970s and early 1980s, rhyme became central to a major genre. If you write rap lyrics, you know that you have to work a much higher proportion of rhymes into your raps than lyricists require for songs with melodies.

- If you rap, you don't have the mnemonic catalyst of melody, so rhyme fills that requirement. In any given eight bars of rap, you need to come up with *two to four times* the number of rhymes as does a lyricist setting words to a melody contained within eight structural bars.

- A single rap lyric has, on average, *more than three times as many words* as a lyric set to a melody. So every rap lyric you write needs, on average, anywhere from *six to ten times more rhymes* than a lyric set to a melody. Including repeats, you have to compose *well over a hundred rhymes*, on average, for a single rap song.

Since true rhymes are in limited supply, you have to supplement true rhymes with near rhymes, especially vowel rhymes:

> *Ladies first, there's no time to rehearse*
> *I'm divine and my mind expands throughout the universe*
> —QUEEN LATIFAH, S. FABER, M. JAMES, S. JOHNSON, & A. PEAKS ("Ladies First")

Listeners may not hear the kind of "perfection" in near rhyme that they hear in true rhyme (and ... um ... maybe not as much "truth"). However, as a lyricist, you have many, many more options for rhyming, because you only need to find rhyming *vowels*. This provides you with a much greater range of emotionally-charged (high-EPA) words to choose from—words that would not be available to you in crucial rhyming positions if you restricted yourself to true rhyme.

See Section 10.11.8 for a discussion of how to use a rhyming dictionary to find vowel rhymes.

3. Identical Rhyme

As you saw in the examples in Sections 10.10.4 and 10.10.5, parallel construction within a verse or chorus means part of each of several consecutive lyric lines repeat. The repeated words amount to *identical rhyme,* which can occur anywhere in consecutive lines—beginning, middle, or end.

4. Wrenched Rhyme

In wrenched rhyme, you deliberately mispronounce a word to create a rhyme. In lyrics set to melodies, the effect is usually playful:

> *sang/brang*
> *road/knowed*
> *purple/maple syrple*

But in rap, wrenched rhyme, like multi-syllable and multi-word rhyme, is standard:

Original Word Pair	Wrenched Rhyme
for/cope	*fo'/cope*
more/smoke	*mo'/smoke*
it go/simple	*it go/simpo*
be a father/prima donna	*be a fatha'/prima donna*

10.11.6 RHYME BY SYLLABLE-NUMBER AND ACCENT

5. Masculine Rhyme

A masculine rhyme is a rhyme in which the last syllable is accented. Rhyme created by two one-syllable words is always masculine. A masculine-rhymed pair can also have several syllables, as long as the last syllable is accented. Masculine rhyme can be true or near:

key / free
complete / obsolete
retrieve / deportee

6. Feminine Rhyme, aka Multi-syllable Rhyme

Narrowly defined, a feminine rhyme is a two-syllable rhyme, or the last two syllables at the end of a word, with the accent on the first of the two syllables:

waiting / relating

Broadly defined, a feminine rhyme is *any* multi-syllable rhyme that does not end with an accent. Here's a triple feminine rhyme:

sleaziness / uneasiness

In lyrics set to melodies, rhymes of one or two syllables sound natural, but rhymes of three or more syllables usually sound funny. If you're not writing rap, you may want to think twice before using multi-syllable feminine rhymes such as *vernacular / spectacular*. That said, sometimes it works. Cole Porter rhymed *mentality* with *reality* in "I've Got You Under My Skin."

In rap, it's a completely different story because rhyme in effect replaces melody. Multi-syllable rhymes are standard, such as this one from 2Pac:

'cause even as a adolescent
I refused to be a convalescent
—2PAC, D. ARNAUD, E. JORDAN, & D. STEWART ("I Ain't Mad At Cha")

7. Multi-word Rhyme

In multi-word rhyme, a non-rhyming word or syllable separates two rhyming words or syllables. The rhymes can be masculine or feminine, true or near.

More examples from the same 2Pac song. The last one uses a wrenched rhyme, *carots*, so that the last syllable (*-rots*) vowel-rhymes with *on*.

quick to holler/little smaller
behind the stairs/the times we shared
ten carots to rock/man on the block

Multi-word rhyme, like multi-syllable rhyme, is ubiquitous in great rap lyrics.

8. Mosaic Rhyme

When you rhyme two or more words with one word that has two or more syllables, you have *mosaic rhyme*, also called *compound rhyme*: The best rap lyrics almost invariably have mosaic rhyme.

In this example, *shot ya* rhymes with the last two syllables of *Sinatra*, and *Peruvians* rhymes with *do me in*.

Who shot ya? Mob ties like Sinatra
Peruvians tried to do me in
—JAY-Z, THE NOTORIOUS B. I. G., L. BONNER, R. FRANKLIN, M. JONES, R. MIDDLEBROOKS, W. MORRISON, A. NOLAND, M. PIERCE, & G. WEBSTER, recorded by JAY-Z & THE NOTORIOUS B. I. G. ("Brooklyn's Finest")

10.11.7 RHYME BY LOCATION IN A PHRASE OR LINE

9. End Rhyme

Rhymes that end lines, whether true, near, masculine, or feminine, tend to stick in memory because:

- After initial exposure to the vocal phrase structure, the listener knows where lines end, anticipates rhymed words, but isn't sure what the rhyme is going to be (that's a surprise—or ought to be).

- The last word of a line has emphasis because there are intervals between phrases; during an interval, the meaning of a lyric line has time to sink into the listener's brain.

Since most end rhymes are masculine, feminine (multiple) end rhymes attract attention.

10. Internal Rhyme

Internal rhyme—rhyme within a line, as opposed to rhyme at the end of a line—is a mainstay of rap. It can be true or near, masculine or feminine.

Internal rhyme works wonders in lyrics because of the temporal proximity of the rhymes:

> *Now hear ye, hear ye, want to see Thee more clearly*
> *I know He hear me when my feet get weary*
> —KANYE WEST & CHE SMITH ("Jesus Walks")

11. Leonine Rhyme

"Jesus Walks" also has *Leonine rhyme*, in which word(s) or syllable(s) in the middle of a line rhyme with word(s) or syllable(s) at the end of the line—a combination of end rhyme and internal rhyme (*hear ye/clearly* and *hear me/weary*).

Here's another example (third line):

> *We live in a political world*
> *Where mercy walks the plank*
> *Life is in mirrors, death disappears*
> *Up the steps into the nearest bank*
> —BOB DYLAN ("Political World")

12. Beginning Rhyme

Both the end and the beginning of a phrase are emphatic positions. Here's an example of *beginning rhyme* from one of the 16 songs you studied in Section 9.5.3:

> *Youuuuuuuuuu ... must take the "A" Train*
> *Tooooooooo ... go to Sugar Hill way up in Harlem*
> —BILLY STRAYHORN ("Take The 'A' Train")

10.11.8
HOW TO USE AN ORDINARY RHYMING DICTIONARY TO FIND MILLIONS OF MULTI-SYLLABLE AND MULTI-WORD VOWEL RHYMES

Rhyming dictionaries list true rhymes only, usually by number of syllables and vowel category. No rhyming dictionary could come close to listing near rhymes, especially vowel rhymes. The reason is that, since you only need to rhyme vowels, not consonants, vowel rhymes are *combinatorial.*

So, how many combinations of vowel-rhyming words are there in the English language? Hmmm ...

First, consider the broad range of vowel *sounds* in the language:

- ***Monophthongs and monosyllables***—simple, single vowel sounds, such as these: *day, hat, arm, saw, see, bed, by, pipe, sit, no, too, got, put, cup, fur.* Depending on dialect, you could easily add more.

- ***Diphthongs and triphthongs***—single-syllable vowels that change as you move your tongue, as in words such as these: *toy, how, pew, mouse, coin, bone*, *fire, flour*, and so on. Again, the number of diphthongs and triphthongs varies with dialect.

Next, consider that you only need to vowel-rhyme *one* syllable of one word with *one* syllable of another word, even if both words have more than one syllable.

- The *er* sound in *urban* vowel-rhymes with the *er* sound in *anniversary.*

- The long *e* sound in *bebop* vowel-rhymes with *carefree, ecosystem,* and thousands of other words with a long *e* vowel.

Suppose you have a list of exactly 10,000 English-language words that have at least one long *e* vowel sound. Some of the words on your list are single-syllable, such as *see* and *tree.* Others have two or more syllables, such as *leader, jamboree,* and *congenial.*

- The first word on your list of 10,000 words, regardless of how many syllables it has, vowel-rhymes with each of the next 9,999 words. So now you have 9,999 two-word combinations that vowel-rhyme.

- You're done with the first word on the list, so you can set it aside or delete it. The second word on the list vowel-rhymes with the next 9,998 words. So now you have another 9,998 two-word combinations that vowel-rhyme, none of which duplicates the first 9,999 two-word vowel-rhyming combinations. Add 'em up and you have a total of 19,997 two-word rhymes. And you're just getting started.

- Suppose you keep doing this until you go through all 10,000 words. You end up with 49,995,000 different two-word combinations that vowel-rhyme on the long *e* sound.

- The above also applies to *all the other vowel sounds*. So there are *hundreds of millions* of different vowel-rhyming two-word combinations.

- Then, if you add multi-*word* vowel rhymes and mosaic rhymes to the list, the number of vowel-rhyming combinations leaps into the *billions*.

What does it all mean if you're a rap lyricist?

- First, you'll never come close to running out of first-rate vowel rhymes. With billions of vowel-rhymes available, you need never feel there's a shortage of good ones, the way that there's a shortage of good true rhymes. (How many usable true rhymes are there for *love*? Four or five at most.)

- Second, you can make use of an ordinary rhyming dictionary to find a practically limitless number of unusual vowel rhymes, especially multi-syllable and multi-word rhymes.

Suppose you're looking for words that rhyme with the *ow* sound in *allow*. Use your rhyming dictionary to look up end-rhymes with ***different consonant endings but the same vowel sound.*** For example:

- The syllable *-ouse* (pronounced *-owze*) vowel-rhymes with *allow.* So you get vowel-rhymed words such as *drowse, blouse, eyebrows,* and *carouse.*

- The syllable *-own*, vowel-rhymes with *allow*. You get vowel-rhymed words such as *drown, gown*, *showdown,* and *renown*.

- The syllable *-owl* also vowel-rhymes with *allow*. You get vowel-rhymed words such as *howl, growl, vowel,* and *befoul*.

You can use the same procedure to find multi-syllable or multi-word vowel rhymes. Just look for two-or-more-syllable rhymes in which the vowel sounds in both syllables match, regardless of consonants. For example, long *a* followed by short *e*:

- ***Multi-syllable words that vowel-rhyme:*** *faceless, bracelet, blatant, greatest, outdated, tasteless, persuaded, mayhem*, etc.

- ***Multi-word vowel rhymes:*** *placed a bet, betrayed the chef, paid my respects, made my confession*, etc.

In rap, rhyme is the equivalent of melody, so the more, the better, especially multi-syllable and multi-word vowel rhymes—as long as the meaning of your lyric doesn't veer over the edge of comprehensibility into the abyss of gibberish (right side of the Wundt curve).

Listeners expect multi-syllable and multi-word rhymes in rap, and welcome new ones that surprise them, just as listeners to a melody welcome accented non-chord tones, sequences, modal melody, and other such characteristics of melody that create variety and evoke emotional responses.

Because you can use any ordinary rhyming dictionary to come up with millions of possible multi-word and multi-syllable vowel rhymes, you have no excuse not to have lots of them in your rap lyrics.

Moreover, because of the abundance of vowel rhymes, you don't need to settle for low-EPA words. You can use words with lots of emotional power without reducing the large number of rhymes that a great rap lyric requires.

More on this in Section 10.14.

HOOK SCHMOOK

You may or may not have noticed the absence of the word "hook" in the context of songwriting, here in this book largely about what goes into creating emotionally powerful music and lyrics.

As you know, the term "hook" refers to a catchy or memorable musical or lyrical bit of a song. If you don't know what you're doing as a songwriter, you'll be lucky if your song has a single hook.

But if you *do* know what you're doing, your song will unfold in time as a sequence of dozens of hooks occurring every few seconds from beginning to end. Lyrical hooks, rhythmic hooks, harmonic hooks, melodic hooks.

Don't obsess about whether or not your song has a hook, or where to put the hook. That's a complete waste of time. Instead, concentrate on developing your musical and lyrical composition skills so that you habitually write nothing but hooks.

10.12 10 Techniques for Creating Emotionally Powerful Lyrics (#9): Adhere to the Accent-matching Law (for the Most Part)

10.12.1 ACCENT-MATCHING BY NUMBER OF SYLLABLES

If you ignore the Accent-matching Law, your lyrics will sound amateurish. Accent *mis*matching detracts from, and even nullifies, the emotional impact of high-EPA words and phrases.

Single-syllable-word Accent-matching

Not only do single-syllable words tend to have, on average, high EPA values, they also have accent-matching advantages. Most single-syllable words sound palatable whether they fall on metrically accented or unaccented beats. Exceptions include some function-words (depending on context), especially the articles *a, an,* and *the*, which almost always sound better on unaccented beats.

Two-syllable-word Accent-matching

When you studied *prosody* (poetic meter, rhythm, stanza form, etc.) in school, you learned about several kinds of duple feet, the main ones being:

- Iamb: __ / e. g., *he TRIED to FEED the HIP-po-POT-a-MUS*
  (this is an example of *iambic pentameter*—five iambic feet—which comprises some 90% of all English and American poetry)
- Trochee: /__ e.g., *FEED the HUNgry AL-li-GA-tor*
- Spondee: / / e.g., *JUMP DOWN*
- Pyrrhic: __ __ e.g., *and the*

And triple feet:

- Anapest: __ __ / e.g., *and she REACHED in the BAG for a PLUM*
- Dactyl: /__ __ e.g., *SUM-mer is COM-ing, the LI-ons are PROWL-ing and*

When writing lyrics for songs, the concept of poetic feet takes a back seat to the Accent-matching Law. Otherwise, a line that sounds fine if you read it as poetry (silently or aloud), such as *DID you start LAUGH ing?,* will sound clunky if you mismatch it in a musical setting:

Metrical Accents	●	•	●	•	●	•	●	•
Words	*Did*	*you*	*start*	*laugh-*	*ing?*			

Your listener hears *DID you START laugh-ING?*, and starts laughing.

You can make the line work by shifting the words to match the metrical accents of the music. Here's one way:

Metrical Accents	●	•	●	•	●	•	●	•
Words		*Did*	*you*	*Start*	*laugh- ing?*			

Note that, even though *DID* falls on an unaccented beat, it still sounds accented because it's the *first syllable* of the bar, and the first syllable of the lyric line. So the listener hears *DID YOU start LAUGHing?* Three out of five syllables get an accent.

You can give your lyrics more metrical punch by taking advantage of these facts:

- The first syllable of a VM (vocal-melodic) phrase always has a strong accent, even if that first syllable falls on a metrically unaccented beat

- The first syllable *within a bar* always has an accent, even if that first syllable falls on a metrically unaccented beat

For instance, you could split *Did you start laughing* into two short VM phrases, like this:

Metrical Accents	●	•	●	•	●	•	●	•
Words		*Did*	*you*	*Start*		*laugh-*	*ing?*	

Now the listener hears *DID YOU start ... LAUGHING?* It sounds fine, because *LAUGH* carries an accent as the first syllable of the second bar. (This works even if you hold the note *START* over to the first beat of the second bar.) So *ING* does not have a stronger accent than *LAUGH*. Displacing phrase beginnings to otherwise weak beats—syncopation—makes the whole line sound more emphatic.

This is another reason to keep vocal phrases short, if you can. The shorter you keep them, the more freedom and flexibility you have with respect to accent-matching. The first syllable of any vocal phrase has an accent, whether the phrase begins on a metrically accented beat or a metrically unaccented beat. So the longer the phrase, the more closely you have to match syllabic accents with music-metrical accents.

Three-syllable-word Accent-matching

In duple/quadruple meter, you can easily accent-match three-syllable words that have a natural accent in the middle, such as *be-LIEV-er:*

Metrical Accents	●	•	●	•
Words	*True*	*be-*	*liev-*	*er*

The listener hears *TRUE beLIEVer*, which sounds fine.

But if you shift the syllables by one beat, it doesn't work:

Metrical Accents	●	•	●	•	●	•	●	•
Words		*True*	*be-*	*liev-*	*er*			

Now the listener hears *TRUE BElievER*, which sounds downright dorky.

Some three-syllable words have a natural accent on the first syllable, such as *DIGnity* and *CONstantine*. Others have a natural accent on the third syllable, such as *disapPROVE* and *underSTAND*. In duple/quadruple meter, if you match accents such that the first and last syllables fall on accented beats, you're usually okay:

Metrical Accents	●	•	●	•	●	•	●	•
Words	*Con-*	*stan-*	*tine*		*un-*	*der-*	*stands*	

The listener hears *CONstanTINE ... UNderSTANDS*. Sounds fine. But, again, if you shift the syllables to get a syncopated effect, it doesn't work:

Metrical Accents	●	•	●	•	●	•	●	•
Words		*Con-*	*stan-*	*tine*		*un-*	*der-*	*stands*

The listener now hears *CONSTANtine ... UNDERstands*, and wonders if English is your second language.

In triple meter, with only one accented beat in three, you have to adhere to the Accent-matching Law more closely.

For instance, this does not work:

Metrical Accents	●	•	•	●	•	•
Words	True	be-	liev-	er		

Listeners hear: *TRUE believER*, which sounds inept.

So you have to shift the accented syllable *-LIEV* to the metrically-accented first beat of the bar:

Metrical Accents	●	•	•	●	•	•
Words	True		be-	liev-	er	

That's only one of several good matches. Here's another. In this case, the first syllable in each bar carries an accent (by being the first), so it doesn't matter that neither of the first syllables falls on the metrically accented first beat:

Metrical Accents	●	•	•	●	•	•
Words		True	be-		liev	er

The listener hears: *TRUE be-LIEV-er*, which sounds natural.

Four-or-more-syllable-word Accent-matching

As you learned in Chapter 7, in measured music, there are only two- and three–beat pulses. So four-or-more syllable words break into two- and three-syllable chunks, and the above guidelines apply.

Compound Words

When composing lyrical phrases, you can put two words together to form a compound word. A compound word will have its stress on the first syllable: *Pass the MOONshine*. But when you separate the two words, the resulting phrase usually has its stress on the second syllable: *Let the moon SHINE*. You need to take this into account when fitting phrases into metrical units.

10.12.2 MORE ON RAP ACCENT-MATCHING

Know Where the Bar Lines Are—Even if Your Listeners Don't Know

Although the Accent-matching Law applies to rap lyrics, the Law's grip is not quite as tight as it is in lyrics matched to melodies. In a rap song, there's no specific melody and there are no obvious chord changes to clearly define bar lines and structural phrases. So individual pulses take on more significance.

If you're a rapper, you can often get away with matching unaccented speech-syllables to accented beats. Listeners won't notice clumsiness because the bar lines, which normally define the positions of the strongest metrical accents, are in the background. You can choose to make the bar lines and phrase boundaries blatantly obvious if you want to, but you don't have to.

In slower-tempo rap, double skipple pulses are embedded in slow macro beats (see Section 7.6.3). In faster-tempo rap, single-skipple pulses prevail—the meter is straightforward combined quadruple. Either way, you get to work with comparatively strong accents on every macro beat. In the absence of melody, you're freer to emphasize rhymed syllables by pitching them higher vocally than unrhymed syllables, and matching them to accented beats pretty much anywhere in an eight-bar period.

But there are limits. *Rhythmic* delivery of your lines (*flow*) is just as important as rhyme. If you're an aspiring rapper, no matter how loose your flow, you still have to acknowledge the power of the beats. Which means that, even if the bar lines aren't obvious to the listener, *you* have to know exactly where they are at all times and deliver your lines such that, every two bars or every four bars, you cue the listener

that you've crossed a structural phrase-demarcation point. Start a new sentence or phrase, throw in a sampled effect, ring a bell—do something to mark the (usually four-bar phrase, eight-bar period) boundaries of the underlying structure. If the song does not reveal structure in some way as it unfolds in time, your listener will hear a lot of randomness and won't remember much of it.

Accent-matching in Eminem's "Lose Yourself"

Eminem's "Lose Yourself" (co-written with Jeff Bass and Luis Resto), which won the Oscar for Best Song in 2002, is an up-tempo (170 BPM) rap song in combined quadruple meter (four skipple pulses to every bar). The 16-bar chorus is comprised of an eight-bar period that repeats once. The diagram below shows this eight-bar period, with capital letters indicating which words and syllables Eminem vocally emphasizes with raised pitches. (If you haven't heard this song in a while, you may want to get it and listen to it—especially the chorus—to refresh your memory.)

A couple of things to note:

- Eminem has carefully chosen mostly rhymed syllables for vocal emphasis. Only two or three of the 19 emphasized syllables are *not* rhymes.

  LOSE / MUSic / Moment / OWN
  BETter / NEVer / LET / GO / ONly
  ONE / SHOT / NOT / CHANCE / BLOW / OPpor
  TUNity / ONCE / LIFE / YOU

  (In an eight-bar period of a typical lyric set to a melody, there are only two to four rhymed syllables.)

- The eight-bar period is divided into two four-bar vocal phrases that occupy the same number of beats of each structural phrase. Each vocal phrase starts before beat one of bar one of the structural phrase:

  PHRASE 1: *(You better) lose yourself in the music; the moment you own it, you better never let it go.*

  PHRASE 2: *(You only get) one shot; do not miss your chance to blow; this opportunity comes once in a lifetime.*

  (There are 39 words in these two lines. An eight-bar period of a typical lyric set to a melody has only one-half or one-third as many words.)

Beats & Pulses	● • ● • ● • ● •	● • ● • ● • ● •
Words	*LOSE yourself in the MUS-*	*ic; The MO- ment you OWN*
	It you BET- ter NEV- er LET it	*GO You ON - ly get*
	ONE SHOT, do NOT miss your	*CHANCE to BLOW, This OPpor-*
	TUN- I- ty comes ONCE in a	*LIFE- time. YOU bet- ter*

EMINEM AND THE RAPPIN' COURT RULING

Eminem's 1999 album, *The Slim Shady LP* has a song called "Brain Damage," which includes a verse that mentions an eighth grade classmate of Eminem's named DeAngelo Bailey. Here are some lines:

I was harassed daily by this fat kid named DeAngelo Bailey
An eighth grader who acted obnoxious, cause his father boxes
So every day he'd shove me into the lockers

Bailey sued, claiming Eminem slandered him.

In 2003, judge Deborah Servitto dismissed DeAngelo's suit in a 14-page ruling. The document included the following footnote:

To convey the Court's opinion to fans of rap, the Court's research staff has helped the Court put the decision into a universally understandable format:

Mr. Bailey complains that his rep is trash
So he's seeking compensation in the form of cash
Bailey thinks he's entitled to some monetary gain
Because Eminem used his name in vain

Eminem says Bailey used to throw him around
Beat him up in the john, shoved his face in the ground
Eminem contends that his rap is protected
By the rights guaranteed by the first amendment

Eminem maintains that the story is true
And that Bailey beat him black and blue
In the alternative he states that his story is phony
And a reasonable person would think it's baloney

The Court must always balance the rights
Of a defendant and one placed in a false light
If the plaintiff presents no question of fact
To dismiss is the only acceptable act

If the language used is anything but pleasin'
It must be highly objectionable to a person of reason
Even if objectionable and causing offense
Self-help is the first line of defence

Yet when Bailey actually spoke to the press
What do you think he didn't address?
Those false light charges that so disturbed
Prompted from Bailey not a single word

So highly objectionable it could not be
Bailey was happy to hear his name on a CD

Bailey also admitted he was a bully in youth
Which makes what Marshall said substantial truth
This doctrine is a defence well known
And renders Bailey's case substantially blown

The lyrics are stories no one would take as fact
They're an exaggeration of a childish act
Any reasonable person could clearly see
That the lyrics could only be hyperbole

It is therefore this Court's ultimate position
That Eminem is entitled to summary disposition

Use A Blank Structural Phrase Grid

You might find it helpful when working on accent-matching to make yourself a blank 16-bar structural phrase grid, like this one, and run off a bunch of copies:

You can use a grid to pencil in words, phrases, lines, even whole verses and choruses. You can experiment with a variety of possibilities until you're satisfied that your accent-matching is working.

In addition to making it easier to match syllables with metrical accents, a structural phrase grid will help you size up start points and intervals between vocal phrases, locations of masculine and feminine end rhymes, and places where parallel construction might fit.

If you work at it, you will almost always be able to find several options for any given word or phrase to fit suitably with music-metrical accents.

10.13
10 Techniques for Creating Emotionally Powerful Lyrics (#10): Don't Hesitate to Revise

Easy writing's curst hard reading.
—RICHARD BRINSLEY SHERIDAN

You've probably heard tales of great classic songs written in 20 minutes. On the backs of envelopes, of course. Or hotel stationery. Or napkins.

Two kinds of songwriters do little or no revising:

- ***Knowledgeable pros (a fraction of all pros)***—the few who already know most or all of the stuff in this book, whether they learned it formally or informally. A minority of them are capable of composing respectable, listenable, even good songs in relatively short bursts, without much revision.

- ***Rank amateurs.*** Recall from the Introduction: *songwriting "talent" is not a special gift. Anybody with no technical knowledge whatsoever can write a set of lyrics, a melody that fits, and a chord progression. In other words, a "song."* So that's exactly what happens. Countless songwriters, members of bands and solo artists, who think they know what they're doing—but don't—release tens of thousands of mediocre independent and major label CDs every year. A tsunami of original songs, "inspired" unrevised wonders, nearly all of which are boring or confusing or both.

There's no substitute for putting in the time and effort it takes to learn technique. One way or another, all of the great songwriters *did* learn their technical stuff. Lennon-McCartney, Berlin, the Gershwins, Dylan, 2Pac, Mitchell, Eminem, Bowie, and the rest—all of them. The evidence, as discussed earlier, is in their songs.

Moreover, most great songwriters *do* revise their work.

You may have heard songwriters you know make statements along these lines:

- "I wrote three songs yesterday. They all just came to me as gifts."
- "You can easily over-edit and destroy your raw first inspiration."
- "Revising a song ruins it."
- "There are no rules!"
- "Great songs come out of nowhere."

Rubbish.

Those are the claims and rationalizations of the clueless.

Just because a song comes to you in a burst of "inspiration" in 10 minutes on hotel stationary, that doesn't make it a good song. It's probably drivel. Inspired drivel, but still drivel.

It bears repeating that *anybody with no technical knowledge or skills can write a song.* Writing "a song" requires ***zero talent and zero know-how***, just as writing "a poem" requires zero talent and zero know-how. Any five-year-old can write a poem or a song.

When you write a song, if you don't know what you're doing from a technical standpoint, you simply default to ineffective technique, the technique of the clueless.

As you know by now (assuming you've read the previous chapters), when you write a song, there are *hundreds of ways you can screw up royally* without knowing that you've screwed up. If you don't know the difference between technique that works effectively in communicating your imaginative vision, and technique that does not work, you will always write mediocre music and lyrics.

If you want to create great art, you have to know the technical rules that actually work, apply those rules, and revise your songs where they require revision. Such revision will not spoil or destroy an inspired idea for a song. Instead, revising will help turn the words and music you imagine into works of art that will attract appreciative audiences.

If you want to write great lyrics, the next section describes a suggested approach you might find useful.

10.14 Putting It All Together: A Suggested Approach to Composing Lyrics

10.14.1 THE LYRIC-WRITING PROCESS AND THE WUNDT CURVE

In Section 9.16, you learned an approach to composing a song "music first." This section sets out a "lyrics first" approach that may differ from the way you usually write lyrics.

If you're like nearly all songwriters, you probably write lyrics more or less like this:

- You keep a notebook or computer file where you enter inspired ideas and images and lyric lines that come to you every so often. Whether you've thought about it before or not, this material sits somewhere along the good ol' Wundt curve:

    - It consists mostly of unfinished but straightforward story lines, themes, verses, and choruses that make complete sense—left side of the Wundt curve; or

    - It's mostly a random collection of totally unrelated phrases and lines—right side of the Wundt curve; or

    - It's comprised mostly of striking, evocative figures of speech, images, and literary symbols—top of the Wundt curve

- When the mood strikes, you sit down with your notes and a thesaurus, a rhyming dictionary, and a guitar or keyboard. You, and possibly a collaborator or two or three, spend 20 minutes or a couple of hours or a few days or even several weeks writing a lyric. (Or maybe both a lyric and the music for it.)

Regardless of the kind of material you *started* with, your *finished* lyric could end up ...

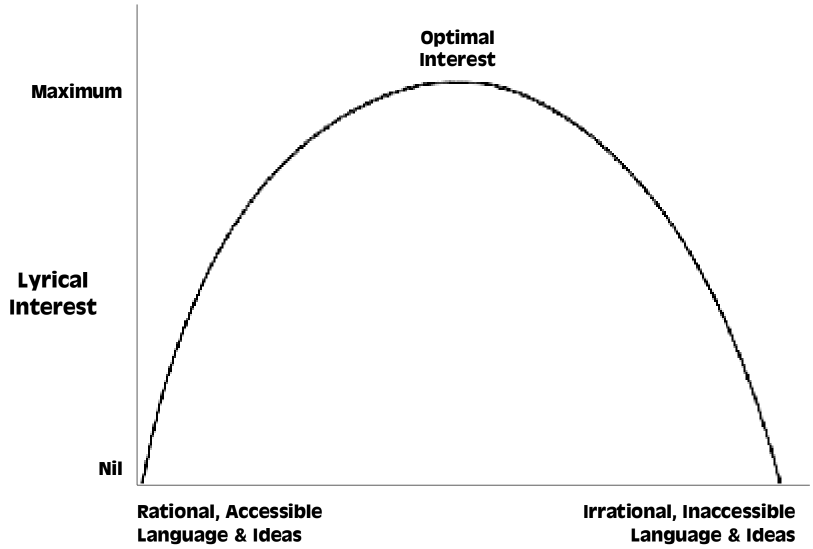
- Somewhere on the left side of the Wundt curve. A lyric that plays it safe, such as a Generic Artless Relationship Lyric. A linear, predictable story or theme that just says what it says in direct, rational, straightforward language, with little or no metaphor, concrete imagery, or insight; or

- Somewhere on the right side of the Wundt curve. A pastiche of images and figurative language without a meaningful focus. Sophomoric and pretentious; or

- At or near the top of the Wundt curve. A lyric that seizes the listener's attention because it's rich in human interest, concrete imagery, well-conceived figurative language. A piece of writing that takes on even more emotional power when set to music competently.

Few songwriters turn out finished lyrics that could fairly be described as top-of-the-curve (#7, 8, and 9 in Figure 136 below).

FIGURE 136 Wundt Curve of the Lyric-writing Process



1	START HERE, END HERE		
2			START HERE, END HERE
3	START HERE		END HERE
4	END HERE		START HERE
5	END HERE	START HERE	
6		START HERE	END HERE
7		START HERE, END HERE	
8	START HERE	END HERE	
9		END HERE	START HERE

Whatever you start with, you want to finish with a top-of-the-curve lyric.

But starting your lyric-writing process by working with the notes you've been keeping has a couple of serious disadvantages:

1. Your notes may have a few high-EPA content-words that apply to your chosen theme or story. But when it comes to fleshing out the rest of the lyric, you probably gravitate towards content-words that spring readily to mind. Many, if not most, are likely to be the kinds of words you use in everyday *rational* conversation. Not high-EPA words.

2. If you set out to write a lyric around an idea or a title from your notes, you already have a pretty good idea of where the lyric's going to go. That means

your completed lyric is not likely to surprise anybody. Not yourself, and not your prospective audience.

So what do you end up with? A finished lyric to be sure. Possibly a serviceable one, but not a great one.

Now you're going to learn an approach to lyric-writing that removes the disadvantages of working with your existing notes. This approach has two main advantages:

1. This approach consists of a set of technical rules which, if you apply them in sequence, will ensure that your finished lyric will be highly evocative and effective. If you have a strong belief that "there are no rules," then you won't want to bother with this approach. The fact is, there *are* rules of effective composition, both musical and lyrical. The reason they work is that the human brain and sensory organs have evolved to perceive and process environmental stimuli and information efficiently in certain ways. If you abide by the "rules," your songs will be accessible to your listeners' brains. You can choose to ignore rules of effective musical and lyrical composition if you want to. The Music Police will not pay you any mind. Nor will the Lyric Police. Nor will listeners.

2. This approach ensures utter originality and the unmistakable signature of your personality. You will select every individual word in your lyrics. The set of words you select for a given lyric will be entirely different from the set of words anybody else selects. You will compose unique phrases that bear the stamp of your individuality. And rhyming couplets, and entire verses and choruses.

If you decide to try it, here's the process you'll go through:

- Instead of starting with ideas, phrases, lines, and song titles from your notes, you'll start fresh, with no notes. You'll go through a series of steps that will culminate in an amazing middle-of-the-Wundt-curve lyric.

- The first thing you'll do is build a "seed list" of *unrelated, out-of-context* high-EPA words.

- You'll work up to phrases, then rhymed lines, all comprised mainly of those high-EPA words you selected for your seed list. Then you'll stop.

- You'll enlist your unconscious mind to solve the mystery of the lyric. Without conscious thought or effort on your part, a compelling theme or story will emerge that only could have arisen from your particular mind. As discussed

at the outset of Chapter 9, surprise is what emotional response is all about. When the theme or story—a Gestalt—surfaces from your unconscious mind, it will surprise you. And because it surprises *you*, it will surprise your listeners and move them emotionally.

- *Lastly* in the lyric-writing process, you'll decide on a title.

Because you will *begin* with a list of high-EPA words, the lyric you will have at the *end* of the process will be powerful, unique, and original—a hundred times better than any lyric you could have written otherwise. And a hundred times better than any lyric your songwriting peers could come up with.

10.14.2 THE END OF WRITER'S BLOCK

In long-form creative writing, writer's block can and does happen. No wonder. If you're writing a play or a novel or even a short story, you have to come up with at least one major theme, plus a lot of fleshed out characters and their interactions, plus many sub-themes and sub-plots. It's understandable that all the ideas and characters you have to develop may not come tripping merrily out of your brain exactly when you need them. Writer's block strikes.

There's no need for writer's block to ever trouble you as a lyricist if you use the approach described in the next few sections.

- First, you only need to write a dozen or two lines. If you're writing a rap lyric, maybe 50 to 100 lines. But half or more of those lines will consist of *repeated material*. You don't have to even think about the scary prospect of writing thousands or tens of thousands of words.

- Second, you don't have to concern yourself with creating a whole cast of believable three-dimensional characters who interact in complex ways. You don't have to work out intricate plot details or write long passages of description. In a lyric, you don't have time to get into that level of detail. You have to say everything you're going to say in three or four minutes, using only 60 to 80 unique content-words (or a couple of hundred in a rap lyric).

As noted earlier, your brain is a prediction machine. But it's also a pattern-finding and pattern-making machine. You always have something original and insightful to say, whether you realize it or not. And your mind can find a way to say it in short-form writing. Your brain will come up with meaningful patterns if you start with a powerful seed list.

Not only that, the phrases and lines and rhymes you create will be much different from those any other songwriter could create.

The lyric-writing approach presented here has one main drawback. At the outset, it will take you a lot more time and effort than you're probably accustomed to investing in a mere song lyric.

But its advantages make it worth your while to at least think about trying:

- Your lyrics will take a quantum leap in both originality and quality. Quality matters much more than quantity. If you write mediocre lyrics for 500 songs, no one other than your mother will care. But if you write 5 top-of-the-curve lyrics, everybody will want to touch the hem of your garment.

- You'll never have to worry about writer's block.

- Although your first lyric will take a good week or two (even if it's only a dozen lines), your speed and output will improve over time without loss of quality. You'll rarely if ever write another mediocre or throw-away lyric.

10.14.3 WHERE TO BEGIN? OUTSIDE YOUR COMFORT ZONE: USE *RIT* TO BUILD A SEED LIST OF INDEPENDENT HIGH-EPA WORDS

In Section 10.4, you were ordered to get *Roget's International Thesaurus*, *6th Edition,* edited by Barbara Ann Kipfer. Now you're going to learn how to use this mighty instrument.

Customize Your *RIT*

First, you'll need to customize your *RIT* with labels. Get some of those little Post-It style sticky notes.

- Label one sticky note "Index" and stick it at page 789.

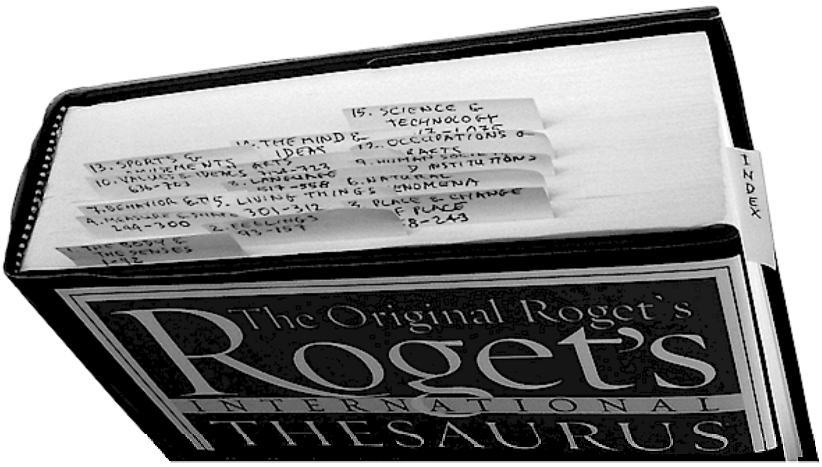
- Label 15 others with the numbers and names of each of *RIT's* 15 major categories of words, and the range of sub-categories within each major category. For example, the first one should read:

1. THE BODY &
   THE SENSES
   1 - 92

Stick each of the 15 category labels at the *top* of the appropriate page. That way, they won't get all mangled as you flip through the book.

Your labelled *RIT* should look like this (Figure 137):

FIGURE 137 ***RIT*** **with Index and Category Labels**



How to Build Your Seed List

Next, build a *seed list* of 120 high-EPA words. From *each* of the 15 major *RIT* categories, you will need to select:

- 1 noun that names a person/character ("personal word")
- 1 noun that names a place
- 1 noun that names something other than a character or place
- 3 action verbs
- 1 adjective
- 1 adverb

(Add 2 tbsp baking soda. And a pinch of cayenne pepper.)

Here's how to cherry-pick the words you need for your seed list:

- Select from the 15 major categories *regardless* of the 1,075 sub-categories. As long as each word comes from a different *major* category, it doesn't matter which sub-category it comes from.

- Look for *loaded* words. High-EPA words. Words that evoke strong emotional responses, be they nouns, verbs, adjectives or adverbs. Select words with high connotative intensity, whether positive or negative (or both). The more emotionally loaded, the better.

- Select emotionally powerful words that you personally would like to work with. Each of the 15 categories has thousands of words to choose from. You only need to select 8 words from each category. Many are high-EPA words. You will find some more fascinating and appealing than others, because of your particular personality. Select those high-EPA words.

- *Do not select synonyms or words that cluster in themes.* What matters is *independent* representation from each of the 15 categories. The other two things that matter are high-EPA value, and representation of each part of speech in the proportions indicated.

Table 73 below is an example of a finished seed list. Your seed list will, of course, be entirely different—unique to you. Lay out your own seed-list with the same labelled columns. Or make a copy of the blank one at the end of this chapter.

TABLE 73 Seed List of High-EPA Words Cherry-picked from *RIT*

NOUNS			VERBS		
CHARACTERS	PLACES	THINGS			
I, you, he, she, we, they, etc. * * * Superman zealot everybody pirate Athena intruder innocent jailer blood relation Carlos master fiddler pilot pawnbroker foreigner	dining car highway interchange gate heaven(s) lounge Egypt borderlands marsh St. Louis desert tower stage door ring (boxing) mattress reactor	eyeball scowl syringe dome boyhood/girlhood midnight masterpiece tattoo reunion crown Friday caricature diamond(s) garbage blade	scorch treasure sweep water down blossom darken perform criticize overhear mislead stray bet (on) shoot vanish blaze	overpower leave one cold devour strangle awake/awaken scream hold fast sing scrawl madden keep faith stitch up entertain threaten sweat	listen to console capsize fatten sacrifice rain begrudge forge (shape) speak in tongues care for do one wrong fire (energize) stumble raise the devil harvest
ADJECTIVES			ADVERBS		
disguised electrifying mother heavy shaky raw	enslaved smooth solitary eternal beautiful counterfeit	lucky accidental fragile	clean/cleanly rudely up/upward(s) by slow degrees underground at will	together as the story goes fashionably in torment	in time the hard way for laughs seldom everywhere

To build your seed list, you will need to use your skill as a word artist. How well can you discriminate between high- and not-so-high-EPA words?

A few guidelines:

- Expect to spend an average of several minutes selecting *each word*. That means selecting 120 words is going to take you anywhere from 6 to 15 hours! The good news, as you'll soon see, is that you'll only have to do a complete 120-word seed list *once*. And when you're finished, you'll have the makings of a brilliant, unique, and emotionally compelling lyric.

RAP LYRICS: If you're writing a rap lyric, you'll need to build a list that has *two or three times* the number of words (about 250 to 350 words) because the average rap lyric requires a lot more words than the average lyric set to a melody. Go through the process of selecting 120 words. Then do it all over again. Then once more, if you haven't gone insane. *Do not look specifically for words that rhyme!* Not yet. That'll come later. If you look for words that rhyme at this stage, you'll unnecessarily compromise on quality.

- The words on your seed list need to be independent of each other. So do not, repeat, *do not* even think about finding synonyms. The whole point of selecting one word by part of speech from each of the 15 major categories (except for verbs—three from each major category) is to represent the whole broad spectrum of human experience—from your personal perspective—on your seed list, including areas of thought and feeling that you don't often think about consciously. Words that are *out of your comfort zone*.

- If you're in doubt about adding a particular word to your list, simply ask yourself, "How emotionally loaded, positively or negatively, is this word?" If the answer is, "Only a bit," then don't select it. If you're sensitive to connotative meanings, you should find it fairly easy, albeit time-consuming, to assess connotative value and cherry-pick high-EPA words. (Don't forget, you're selecting words that have significant emotional meaning for *most people*—whether you share those strong feelings or not.)

  Few words will be as high-EPA as, say, *holocaust*, *mother, suicide, rose, Jesus, betray, London,* and *slavery* (not to mention all the high-EPA words and phrases commonly used in gangsta, such as *fuck wit, muthafucka, nigga, Mercedes, pimp, the pigs, Hennessy, pistol whip, crib, ho, bitch*, etc.). But you should easily be able to sense and reject words that have moderate or low EPA value, such as *introspective, paper clip, nonchalant, budgetary, onlooker, conventional, process,* and *vestibule*. If you're not terribly sensitive to connotative meaning, if you can't tell the difference between emotionally loaded and emotionally neutral words ... maybe lyric-writing isn't for you.

- Words to avoid: jargon, euphemisms, cliches (especially cliches), and words that few people know.

SNOOP DOGG: "MISOGYNY? WHAT'S MISOGYNY?"

Oh that cute Snoop Diggidy Doggidy! He's so cool. And so lovable with his drawl and all. So iconic and unassailable that hardly

anyone in the American media dares offer a word of criticism when he produces high art such as this, from *Rhythm & Gangsta:*

> *Can you control your hoe? (You got a bitch that wont do what you say)*
> *You can't control your hoe? (She hardheaded, she just won't obey)*
> *Can you control your hoe? (You've got to know what to do, and what to say)*
> *You've got to put that bitch in her place, even if it's slapping her in her face.*
> *Ya got to control your hoe. Can you control your hoe?*
> —SNOOP DOGG, P. BROOKS, & L. T. HUTTON, recorded by SNOOP DOGG ("Can U Control Yo Hoe?")

In building your seed list, you are *pre-selecting* words for the same reason you pre-selected musical elements back in Sections 9.6.2 and 9.16.2. Pre-selecting words forces you out of your comfort zone, while maintaining the originality of your word choice.

A few things to note about the list in Table 73 above:

- At the top of the first category of nouns—"Characters"—there's a group of pronouns. This is just to remind you that personal pronouns are important, and you'll be using them in your lyric. But you'll also need nouns that reference people more specifically—one from each of the 15 major categories.

- Most of the 45 nouns are *concrete*, not abstract.

- The largest single category is "Verbs" because the more verbs (except linking verbs) you use in your lyric, the more life your lyric will have. Each of the three verb-columns has 15 action verbs, one from each of the 15 major categories. Practically all of the verbs in *RIT* are action verbs because the English language has only a smattering of linking verbs. But, of course, some action verbs are much more emotionally loaded than others. Those are the ones you want on your seed list.

- You'll need only one adjective from each of the 15 major *RIT* categories, and one adverb from each category. Adverbs are in short supply in *RIT* (and every other thesaurus). Don't worry too much about them, as you'll be using few, *apart from adverbs relating to time and place*. Try to avoid adverbs that end in -ly. And, whatever you do, avoid the adverb *very*.

An Emotionally Feeble (Low-EPA) Seed List

For centuries, the English language has accepted and incorporated words from other languages. Today, the English language has more words, and far more synonyms, than any other language, and *RIT* is one of the most comprehensive collections of English-language synonyms.

The words in Table 74 below represent the neutral end of the connotative spectrum in the English language. Yet both Table 73 and Table 74 were compiled in the same proportions and from the same categories of *RIT*. In Table 74, the words are so devoid of inherent EPA value that if you were to use them to write a lyric, your song would evoke little or no emotional response—other than irritation or amusement. Even if every line scanned perfectly and rhymed true, a lyric drawn from the words in Table 74 would sound like a bureaucratic report from the Office of Integrated Participatory Befuddlement.

TABLE 74 Seed List of Low-EPA Words from *RIT*

NOUNS			VERBS		
CHARACTERS	PLACES	THINGS			
hosier excursionist topographer expositor factotum enamelist discount broker enunciator recreant facilitator meliorist epigrammatist turf accountant antecedent radiologist	conveyance debarkation baseline utility room centricity rostrum bailiwick technical school diorama encompassment infrastructure emplacement synthetic fibre surface bishopric piggery	munchies alacrity averaging modality senescence aeration methodology convexity business directory usurpation incontinence lithography golfing grip oncology systems analysis	process decompress disarrange maintain join the choir invisible effervesce be at variance apprise exacerbate forswear oneself instrumentate serve in the capacity of concretize bifurcate automatize	nutrify ossify regress consolidate anthropomorphize becloud throw in the towel superscribe administrate have one's cake and eat it explicate wattle officiate confute vitrify	lactate count one's chickens before they're hatched directionize quantify vivify aspirate pedestrianize synopsize commission eschew symphonize remonetize caracole appertain to granulate
ADJECTIVES			**ADVERBS**		
adrenal supportive transposed incumbent herbaceous climatological	contributory compendious untenable bumptious monodic parabolic	gladsome permutable corporeal	imperviously unvaryingly thereinto measurably at the crack of dawn	precipitately severally turgidly conjointly equably supernally	tooth and nail on the chinstrap basically wanly

Characteristics of the words in Table 74:

- Low EPA value, including words everyone knows, such as *basically* and *quantify*
- Silly or trite words—unless you're writing comedic lyrics (*munchies, piggery*)
- Cliches (*count one's chickens before they're hatched, at the crack of dawn, tooth and nail, have one's cake and eat it*)
- Jargon (*serve in the capacity of*)
- Euphemisms (*join the choir invisible*)
- Words few people know

A LYRICAL LESSON FROM THE GREAT JOHN PRINE

Trust a mind like John Prine's to create admirable lyrical art out of nothing but cliche. His song "It's A Big Old Goofy World" is well worth downloading. Here's a sample:

Up in the morning
Work like a dog
It's better than sitting
Like a bump on a log
Mind all your manners
Be quiet as a mouse
Some day you'll own a home
That's as big as a house

10.14.4 NEXT: USE YOUR SEED LIST TO BUILD A LIST OF INDEPENDENT PHRASES AND "EVENTS"

Now that you've spent hours and hours building your original high-EPA word list, rich in verbs and concrete nouns, it's time to get creative with it.

But before you start, you may want to review Sections 10.5 to 10.10. And have a beer.

Then sit down with your seed list in front of you and a blank word processor screen or blank sheet of paper. Using your seed list, start creating short phrases and "events"—short sentences that contain a "personal word," a noun, an action verb, and possibly a reference to time. When you put these ingredients together in a phrase or short sentence, you have a story-building event.

A few guidelines (rules, rules, rules ... but they work!):

- You will need to use function-words (see Section 10.9)—but avoid *am, is, are, was ,were, be, being, been.*

- Include references to time and/or place in most of your phrases. (Section 10.3.2 has a list of time-orienting adverbs.)

- As you build your list of phrases and short sentences, don't try to make meaningful linkages between them. That'll come later. What you're doing is

building another *list* of unique original material, a list of *unlinked, independent* items—phrases this time, instead of words.

- Make at least 50% of your phrases "personal" phrases: questions, commands, dialogue, exclamations.

- Although the phrases you're composing are independent of each other, ensure that at least 15% of the total number of *words* that make up your complete list of phrases are "personal words"—words that name or reference a person/character. Some of your phrases will contain no personal words, some will contain one personal word, some will contain two or more personal words.

- Don't be afraid to put *unreasonable, illogical* combinations of words together into phrases—but without resorting to simply combining words randomly into meaningless babble (review Section 10.8).

You may be wondering ... what about incorporating content-words that are *not* on your seed list into your phrases?

As you're composing phrases using content-words from your seed list, your parallel-processing brain acts like a thesaurus and presents you with alternative phrases comprised of words with similar meanings that are not on your seed list. This phenomenon is called *priming*.

Don't automatically use these words in building your phrase list. You're trying to compose phrases that have the greatest emotional impact. As long as you stick to phrases made of words you originally selected for your seed list, a list of high-EPA words that took you so much time to compile, you will be assured of creating emotionally powerful verses and choruses.

On the other hand, at least some of the words and phrases that pop into your mind due to priming will have sufficient connotative value for your lyric. So go ahead and add them. They represent the uniqueness of your personality.

In particular, don't hesitate to use high-EPA *proper nouns* that come to mind, such as names of people, nations, languages, cities, institutions, saloons, religious figures, horses, etc., as discussed in Section 10.3.2. Again, the proper nouns you choose will reflect your personality.

When do you stop building your list of phrases?

When you've got at least a couple of hundred. Most of them won't make it into your lyric. But you'll need a large enough pool to turn over to your unconscious mind, as you'll see shortly.

RAP LYRICS: You'll start with a larger seed list, and you'll also need to build a much larger phrase list—perhaps 400 to 500.

A couple more points:

- Most of your phrases will be short, around five or six words, including function-words. So you should be able to get 100 phrases on a single 8 ½ by 11 sheet of paper in a couple of columns. Two or three sheets should hold your entire phrase list. This is important because, when you're using your phrase list to compose rhyming couplets (that's next), you'll want to be able to scan the whole phrase list at a glance, the way Ms Puma scans her whole saloon at a glance, looking for trouble-makers.

- The number of meaningful two-, three-, and four-word phrases you could construct using only the 120 words on your seed list is in the multi-millions because language is combinatorial. For example, the phrase *threaten the pawnbroker* has a much different meaning than *the pawnbroker threatens*, even though both phrases use the same words. So if you're ambitious enough to compose more than 200 phrases, by all means do so. The more you compose, the better.

Here is a short list of 21 independent phrases and events built from the seed list in Table 73. (A few of these phrases contain words that emerged as a result of priming, as well as ***time- and place-orienting words*** not on the seed list.) Your list of phrases needs to be 10 times as long—or 30 to 40 times as long if you're writing rap.

Why did he wait at the stage door tonight?

Overpower the jailer for his syringe

She kissed a pirate on Friday

Stitch up his eyeballs

Tomorrow, console Athena

She screams from her stone tower

Don't bet on lucky St. Louis

Shoot them now!

I woke up raw on a highway interchange one October night

"Where?" And she said, "Under your counterfeit mattress."

Did his blood relations strangle him at the gate?

Egyptian midnight, Egyptian stars

Darkened her girlhood by slow degrees

The intruder's tattoo

Carlos, scrawl me one more rainy line

In spring, will you devour the heavens?

Once I held her, a masterpiece, fragile as the desert

Like a frightened foreigner

Before long, I saw him stumble through the dining car

"Sacrifice me, I'm innocent" she said

Why did you vanish last night? My shaky blade wants to know

10.14.5 NEXT: USE YOUR PHRASE LIST TO BUILD A LIST OF INDEPENDENT RHYMING COUPLETS

Not another dang list?

Yep. Another dang list. The third and last one.

Your phrase list contains hundreds of original, *thematically unrelated* phrases, each comprised of high-EPA words. It's tempting, now, to use your phrase list to compose whole verses and choruses and just finish up the lyric, already.

Resist!

Don't do it yet. Yes, you could easily finish the lyric. But the results wouldn't be as good as they could be. Keep in mind the ultimate goal: to compose the finest, most evocative and powerful lyric you possibly can. If you jump the gun and finish up now, you'll miss harnessing the creative power of your long-term memory and unconscious mind. (That's coming up.)

At this stage, the next thing you need to do is to use your phrase list to build a list of original two-line rhyming couplets. Make each couplet internally meaningful, but *independent* of the others. A list of *individual* little two-line poems.

The couplets you compose can be short or long. They can be comprised of as few as two phrases from your phrase list, or as many as four or five or even six.

How to Work Rhyme Into Couplets Using Phrases You've Already Written

As you build this list, try to *end-rhyme every couplet*. In a song lyric, rhyme is necessary, not optional, for reasons discussed earlier in this chapter. If you're not writing rap, you only need end-rhymes, preferably true rhymes, masculine or feminine.

Up to this point, you've been able to maintain high connotative (high-EPA) content. You've composed hundreds of emotionally-charged original phrases, thanks to your unique seed list of emotionally loaded content-words.

Now, for the sake of rhyme, you'll have to introduce more content-words that are not on your seed list. To create meaningful rhyming couplets, you will at times have to sacrifice some connotative intensity. To minimize the damage:

- Create as many rhyming couplets as you possibly can *exclusively* from your list of high-EPA phrases.

- When you've exhausted all the possibilities that satisfy you, start creating *unrhymed* but meaningful couplets, still using only the phrases from your phrase list. To rhyme each couplet, select only the end word of one of the lines of the couplet and replace that one word with a word that rhymes with the end-word of the other line in the couplet.

  Suppose you start with the following *unrhymed* couplet, created from two listed phrases:

  > *"Carlos, scrawl me one more rainy line,*
  > *Sacrifice me, I'm innocent," she said*

  You have a choice of getting rid of either *line* or *said*. Then you have to find a rhyme for the other end-word. If you can, replace that end-word with a high-EPA word that rhymes:

  > *"Carlos, scrawl me one more rainy line,*
  > *Sacrifice me, I'm innocent, I'm divine."*

RAP LYRICS: You need a lot more rhyme, an average of two or three rhymes per line. As much rhyme of all kinds as you can find (review Section 10.11).

You'll be starting with a list of some 400 to 500 original emotionally-loaded phrases. With such a large pool, you'll find that many of those phrases already rhyme with each other (true rhyme or vowel rhyme, masculine or feminine, multi-word, mosaic, etc.). But you'll have to modify some lines to create meaningful couplets.

In your phrase list, you should be able to find lots of similar-sound and line-location rhymes without having to modify your phrases too much, thereby preserving their emotional power. For example, here are a couple of highly-rhymed rap lines taken from the short list of phrases at the end of Section 10.14.4, with minimal modification:

A frightening foreigner, first he devours the innocent, now her
Overpower the jailer, get his syringe, she screams from her tower

At this stage, you're composing two-line rhymed couplets. So you'll probably find it helpful to work with copies of a simple eight-bar structural phrase grid to help you with accent-matching:

Or maybe a more elaborate one, such as the one used in Section 10.12.2.

Couplets and Parallel Construction

Select some of the most emotionally compelling phrases on your list and experiment with repeating them verbatim and with alterations. Identical rhyme is still rhyme, and, as discussed in Section 10.10, parallel construction is a powerful lyrical technique.

The Content of Couplets

> It was like opening the door to your house and having someone come in and take your big screen TV off the wall during the big game, and there's nothing you can do about it.
>
> —Sensitive country singer KENNY CHESNEY describing his heartbreak when Renee Zellweger divorced him

Listeners connect emotionally with:

1. ***The lyrical theme of survival,*** and the situations and conflicts that could threaten survival (broadly, the theme of the struggle to avoid death)

2. ***The lyrical theme of reproduction*** (sending genes into the future), and the situations and conflicts that could threaten reproduction (broadly, the theme of struggle over love and sex)

3. ***Lyrical surprise*** in the form of emotionally evocative concrete imagery, symbolism, and figurative language

Here are a few examples of the universal themes of survival and reproduction:

- Cheating on your lover
- Coping with your lover's infidelity
- Leaving your lover
- Getting dumped
- Experiencing hormonally obsessive love
- Feeling insecure about your lover's commitment
- Coping with separation from your loved one or your home
- Clashing with your parents
- Dealing with your own or someone else's life-threatening behaviour
- Dealing or taking drugs
- Committing violent crimes (*I shot a man in Reno, just to watch him die*)
- Coping with unfulfilled dreams or desires
- Expressing religious devotion
- Threatening or getting threatened by a rival
- Seeking revenge
- Running away to escape disadvantageous circumstances

If conflict-engendering themes and story lines such as these are not central to your couplets (and to your lyrics as a whole), they're apt to be boring, boring, boring. The best, longest-lasting literary and lyrical art has always been about struggles around the themes of love and death, and always will be—or at least until humans cease to be fully human and become cyborgs.

Even a lyric as funny and sweet as the Beach Boys' "Fun Fun Fun" reflects implied threats and conflicts:

Well the girls can't stand her 'cause she walks and looks and drives like an ace, now	(conflict with jealous rivals)
She makes the Indy 500 look like a Roman chariot race, now	(street racing, a dangerous activity)
She'll have fun fun fun till her daddy takes the T-Bird away	(parental conflict)

How big a list of rhymed (and parallel) couplets do you need to create?

The bigger, the better. At least one or two hundred *independent* original couplets. Two or three times more if you're writing rap.

10.14.6 NEXT: FORGET ABOUT IT; LET YOUR UNCONSCIOUS MIND WORK IT

Is it worth it? Let me work it.
—MISSY ELLIOTT & TIM MOSLEY ("Work It")

At this point, you've done most of the sloggin' work. Now it's time to let your unconscious mind take over and find a Gestalt or two for you.

Writers and thinkers have always used this technique because it works. Bertrand Russell, who won the Nobel Prize for literature, summarizes what happens:

> I have found that if I have to write upon some rather difficult topic, the best plan is to think about it with very great intensity—the greatest intensity of which I am capable—for a few hours or days, and at the end of that time give orders, so to speak, that the work is to proceed underground. After some time I return consciously to the topic and find that the work has been done.
> —BERTRAND RUSSELL (*The Conquest of Happiness*)

You now have three lists of original material: your seed list, your phrase list, and your couplet list. Put the first two away and focus on your couplet list. Don't do any modifying or editing (or not much), just read all the couplets. Read them over and over and over. Spend several hours doing nothing but reading your couplets, concentrating on them, thinking about what they mean, turning them over in your mind, even memorizing some of them.

Then stop.

Put them away. Don't look at them, and *don't think about them.* That's the key. Don't think about them consciously.

You're assigning a big problem to your unconscious mind:

> ***Somewhere in those independent rhyming couplets, there's a theme, a focus, a Gestalt, a diamond of insight that your conscious mind does not recognize because it's so dang rational. Find it, unconscious mind.***

Get your conscious mind out of the way and let your unconscious mind work over those couplets. For the next day or two or three, do something else with your time. Read a book. Google randomly. Join the French Foreign Legion and have some adventures. Just *don't think consciously about your those couplets*.

With your rational, logical conscious mind out of the picture, your unconscious mind will process what you've written. Recall from Chapter 7 that you are not consciously aware of most of what you know. It's stored in long-term memory. As Harvard marketing professor Gerry Zaltman, one of the founders of neuromarketing, points out:

> Ninety-five percent or more of all cognition, all thinking, including emotion, occurs below levels of awareness.

Your unconscious mind will combine the ideas and words and phrases in your couplets without restriction, ***without any compulsion to make sense.*** And it will make use of what you already have stored in your long-term memory. This is exactly what you want to happen. Remember, great word-art *does not, and should not, merely make complete literal sense.* And it must be original, a reflection of who you are.

10.14.7
NEXT: BE SURPRISED; FINISH YOUR LYRIC

In a day or two or three, go back to work on your couplets.

Now's the time to see if you can discern a single theme or story in some of the couplets. You will probably find that at least one complete lyrical story or theme that you had not thought of previously presents itself pretty plainly.

A song lyric is a bit like a radio or television commercial in that, to succeed, it needs a focus, a main theme or idea or event or character study. Something. Some ... *thing*. The thing that the song is about. A 60-second commercial focuses on one product or service directly (or sometimes indirectly). Focus is critical. If the ad does not draw public attention and customers to that product or service, the ad fails.

In a song lyric, whatever that focus is, usually gets repeated, either in the chorus or as a repeated element of the verse (parallel construction).

See if you can recognize a theme in your list of couplets that now seems evident but has you wondering, "Why didn't I think of that before?" If several different lyrical themes present themselves, choose the most surprising and emotionally compelling one. That one has the greatest value because, just as it surprised you, it will surprise your audience. That's the one to shape into your finished lyric.

> ***The theme could be simple and funny, or it could be exotic and profound. It doesn't matter, as long as it's* surprising and memorable.**

You will no doubt have to revise some of the words, but overall, your finished lyric will still contain mostly the high-EPA words from your original seed list. *But now they'll have a form, a structure* that sits nicely atop the Wundt curve. Your lyric will

be substantive, focussed, concrete, and figurative enough to be compelling to an audience, but not so confusing, random, intellectualized, and chaotic as to be incomprehensible.

Above all, charged with connotative content and personal language, your lyric will be loaded with originality, humanity, and strong feeling.

10.14.8
NEXT: TITLE IT

In the conventional approach to lyric-writing, you're supposed to start with a title, then write a lyric around the title. In the present approach, the *last* thing you do before setting your lyric to music or beats is give it a title.

The title of a song brands it. You're free to title a song whatever you like, of course, but if you want anybody to recognize your song and possibly *buy* it, you'd best give it the obvious title.

Some aspiring songwriters bent on making an "artistic statement" often give their songs bizarre titles that have nothing to do with the lyric. Then they wonder why no one can identify their songs.

The most useful title is the most repeated or most emphatic phrase of the verse or chorus. It reinforces the song's theme.

Phrases tend to work better than single words as song titles.

10.14.9
NEXT: SET IT TO NOTES OR BEATS

Now that you've got an outstanding original lyric, you know what you need to do next. The Section number is 9.16.5.

10.14.10
REPEAT AS OFTEN AS YOU WANT TO

If you took the time and trouble to go through the labourious tasks of building a seed list, a phrase list, and a couplet list, and finally finishing your lyric—good news! You'll never have to build those lists again—at least not completely.

It's not necessary to start from scratch and compile a new seed list for each lyric you write. Suppose you use your first seed list to write a lyric that has a total of, say,

60 unique content-words, of which 50 came from your first seed list. Suppose you're completely satisfied with the lyric.

Now you want to write another lyric. Having expended all the time and effort compiling that first seed list of 120 high-EPA words and phrases, you reckon, rightly, that it would be a shame to waste the 70 perfectly great words on your first seed list that did not make it into your lyric. So ... don't waste them. Remember: the words you selected for your first seed list are *independent of one other*. So you can retain them for your second seed list.

All you have to do, then, is remove the 50 words and phrases from your first seed list that you used in your first lyric, then go back to *RIT* and replace those 50 words and phrases with new ones. It will take you less than half the time it took to compile your first seed list.

> ***Be sure you replace each of those 50 words and phrases (or however many appear in your lyric) using the same RIT categories that each word or phrase came from.***

For example, if you used the adjective from category 11 in your lyric, replace it with another adjective from category 11, and so on. Otherwise, you will slip into a comfort zone of using words and phrases representing a narrow range of human experience. That direction leads to lyrical mediocrity and a lifetime of shelf-stocking at Wal-Mart or cleaning the stables at the Dodge City Horse Store.

Even the smallest of the 15 main categories in *RIT* has thousands of words. So you could, in theory, go through this exercise 1,000 times and, each time, have a fresh seed list to create a completely different, *emotionally compelling* lyric, without ever repeating the content-words and content-phrases in any of your 1,000 songs. Although you probably won't live long enough to write 1,000 songs (at least not 1,000 great songs—although any enterprising ignoramus could write 1,000 third-rate songs), you can take heart in knowing that you can use *RIT* to compile powerful, unique lyrical seed lists for as long as you care to write songs.

As for your phrase list and couplet list, remove only those phrases and couplets that contain words or phrases that appear in the final finished song lyric. Save all the other phrases and couplets. You can use 'em in future songs.

When you decide to write another song, use your topped-up seed list to top up the phrase list, and then the couplet list. Then let your unconscious mind do its work. Then write your next lyric.

Once you've mastered both lyrical and musical technique, as covered in Chapters 3 through 10 (which will take you at least a year or two, depending on how ambitious you are and how much time you devote to acquiring technical songwriting skills), it should (in theory) only take you a week or two to write a brilliant song. Which means you ought to be able to turn out at least 20 or 30 outstanding songs every year for as long as you want to. Songs that tower far above the mediocre songs churned out in the millions every year.

After spending five years acquiring technical skills *without writing songs*, the Lennon-McCartney team then wrote an average of 25 to 30 songs a year for about eight years. The majority have stood the test of time, both lyrically and musically. Dylan's output has been much higher over a longer career, and most of his material is first-rate.

If they can do it, so can you. Never mind the hype and nonsense about "genius" and "God-given gifts." As you've seen, especially in these last few chapters, it's about having the motivation and ambition to acquire knowledge and *master technique*, then applying your imagination.

CONFESSIONS OF LOVE AND THEFT

In 1916, Sir Charles Hubert Hastings Parry set to music the William Blake poem, "And Did Those Feet In Ancient Time." The poem in its musical setting is usually called "Jerusalem." In 1991, Joni Mitchell combined much of Yeats' "The Second Coming" with lyrics of her own to create the song, "Slouching Towards Bethlehem." In these cases, the composers acknowledged the poets as co-authors of the songs.

Sometimes a songwriter uses a pre-existing poem or song to forge a new, original creation. For example, Bob Dylan based his 1963 classic, "A Hard Rain's A-gonna Fall," on the traditional English ballad, "Lord Randall."

In 2001, Dylan released the album *Love and Theft*, with lyrics that contained about a dozen passages from the book, *Confessions of a Yakuza*, by Junichi Saga. The Japanese writer was flattered when he found out Dylan had lifted the passages, albeit without attribution. Saga decided not to sue Dylan, no doubt in part because having his work lifted by one of history's greatest songwriters brought Saga acclaim and royalties from unexpected sales of his book.

Did Dylan, by not acknowledging where he got his lyrics, cross the line from "creative reinterpretation" to plagiarism? Judge for yourself. Here are some examples:

SAGA'S ORIGINAL	DYLAN'S LYRICS
There's nothing sentimental about him—it didn't bother him at all that some of his pals had been killed.	*He's not sentimental, it don't bother him at all how many of his pals have been killed.* ("Lonesome Day Blues")

I don't know how it looked to other people, but I never even slept with her—not once.	*Don't know how it looked to other people, I never slept with her even once.* ("Lonesome Day Blues")
If it bothers you so much, she'd say, why don't you just shove off?	*Why don't you just shove off if it bothers you so much?* ("Floater")
I'm not as cool or forgiving as I might have sounded.	*I'm not quite as cool or forgiving as I sound.* ("Floater")
My mother ... was the daughter of a wealthy farmer ... my father was a traveling salesman ... I never met him.	*My mother was a daughter of a wealthy farmer/ My father was a travelin' salesman, I never met him.* ("Po' Boy")

Other great songwriters have similarly appropriated lyrics without crediting the original author. Paul McCartney, for instance:

"GOLDEN SLUMBERS KISS YOUR EYES" by Thomas Dekker (1603)	**"GOLDEN SLUMBERS" by Paul McCartney, attributed to Lennon-McCartney (1969)**
Golden slumbers kiss your eyes *Smiles awake you when you rise* *Sleep, pretty wantons, do not cry* *And I will sing a lullaby*	*Golden slumbers fill your eyes* *Smiles awake you when you rise* *Sleep, pretty darling, do not cry* *And I will sing a lullaby*

Chuck Berry sued John Lennon for this:

"YOU CAN'T CATCH ME" by Chuck Berry (and probably Johnnie Johnson)	**"COME TOGETHER" by John Lennon, attributed to Lennon-McCartney**
Here come a flat top *He was movin' up with me*	*Here come old flat top* *He come groovin' up slowly*

Berry dropped the lawsuit when Lennon agreed to record three songs owned by the publisher of "You Can't Catch Me." Lennon fulfilled the agreement by recording "You Can't Catch Me," "Sweet Little Sixteen" (also by Berry and Johnson), and "Ya Ya" (Dorsey-Levy-Lewis-Robinson).

Ironically, Chuck Berry found himself on the business end of a copyright lawsuit. Over a period of some 20 years, Berry had filed copyrights in his name only on numerous songs he co-wrote

with Johnnie Johnson, his bandmate and collaborator from the 1950s to the 1970s. In 2000, Johnson finally sued Berry for songwriting credit and royalties, but it was too late. The statute of limitations had expired and the judge dismissed the case. Many in the rock 'n' roll establishment felt terrible about the injustice, and rewarded Johnson with membership in the Rock 'n' Roll Hall of Fame in 2001. He died in 2005.

10.15 Lyrics: Unity, Variety, and Emotional Impact

It's worth reiterating that everything in this chapter applies as much to rap lyrics as to conventional lyrics set to tunes.

Table 75 below summarizes this chapter's important points.

TABLE 75 Optimizing Unity and Variety in Lyrical Composition

	Prefer...	Instead of...
Lyrical theme	• Focussing on themes and stories of conflict relating to matters of survival (life and death) and/or reproduction (love and sex)	• Choosing themes and stories that have little or no inherent conflict or that deal with trivial topics.

Word choice	• Choosing words based on the valences and intensities of their connotative or affective (emotional) meanings • Using action verbs and avoiding linking (copula) verbs, especially *am, is are, was were, be, being, been* • Using concrete nouns • Avoiding adverbs except adverbs of time and place	• Being oblivious of connotative meaning • Using linking verbs such as *am, is are, was were, be, being, been* • Using abstract nouns • Using adverbs of degree, method, or manner
Lyric composition technique	• Using the 10 specific techniques discussed in this chapter • Using the approach to lyric-writing outlined in section 10.14	• Writing lyrics randomly, hoping to come up with something brilliant

THE BEST (I. E., WORST) OF BAD WRITING

Of all the winners of the Bad Writing Contest, this timeless beauty, the 1998 winner, still stands tall as a masterpiece of impenetrable gibberish. There's no excuse for this, even in academic writing. The author, Prof. Judith Butler, may well have drawn upon the word list in Table 74 for inspiration:

> *The move from a structuralist account in which capital is understood to structure social relations in relatively homologous ways to a view of hegemony in which power relations are subject to repetition, convergence, and rearticulation brought the question of temporality into the thinking of structure, and marked a shift from a form of Althusserian theory that takes structural totalities as theoretical objects to one in which the insights into the contingent possibility of structure inaugurate a renewed conception of hegemony as bound up with the contingent sites and strategies of the rearticulation of power.*
>
> —JUDITH BUTLER ("Further Reflections on the Conversations of Our Time," *Diacritics,* 1997)

The next page contains a blank form you can copy and use for seed list construction.

NOUNS (1 from each *RIT* category in each column)			**VERBS** (1 from each *RIT* category in each column)		
CHARACTERS	**PLACES**	**THINGS**			
I, you, he, she, we, they, etc. * * *	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	2.
2.	3.	3.	3.	3.	3.
3.	4.	4.	4.	4.	4.
4.	5.	5.	5.	5.	5.
5.	6.	6.	6.	6.	6.
6.	7.	7.	7.	7.	7.
7.	8.	8.	8.	8.	8.
8.	9.	9.	9.	9.	9.
9.	10.	10.	10.	10.	10.
10.	11.	11.	11.	11.	11.
11.	12.	12.	12.	12.	12.
12.	13.	13.	13.	13.	13.
13.	14.	14.	14.	14.	14.
14.	15.	15.	15.	15.	15.
15.					

ADJECTIVES (1 from each *RIT* category)			**ADVERBS** (1 from each *RIT* category)		
1.	6.	11.	1.	6.	11.
2.	7.	12.	2.	7.	12.
3.	8.	13.	3.	8.	13.
4.	9.	14.	4.	9.	14.
5.	10.	15.	5.	10.	15.

11

How Repertoire, Signature, and Performance REALLY Work

On stage, I make love to 25,000 different people. Then I go home alone.
—JANIS JOPLIN

11.1 Repertoire

11.1.1 What It Takes to Break Away from the Pack

Most people get into bands for three very simple rock 'n' roll reasons: to get laid, to get fame, and to get rich.
—BOB GELDOF, KBE

If you play in a band or as a solo artist (or would like to), you're one in a pack of millions. If you'd like to advance your music career, you need to break away from the pack.

What does it take to break away and get noticed for performing your original songs? Assuming you don't want to trust to blind luck (more on this in Chapter 12), you need:

1. Consistent first-rate songwriting; an adequate repertoire of brilliant songs
2. A signature sound and style
3. Raging ambition
4 Music business knowledge and skills (the subject of Chapter 12)

11.1.2 YOU HAVE NO SERIOUS COMPETITION

> Skill without imagination is craftsmanship and gives us many useful objects such as wickerwork picnic baskets. Imagination without skill gives us modern art.
>
> —SIR TOM STOPPARD

As for the pack of millions from whom you would like to break away—how are they faring?

1. Songwriting Skills

They're not faring well. ***The song is the currency of the music business.*** Nearly all songwriters deal in weak, devalued currency; hardly any songwriters are highly skilled *and* highly imaginative (see Figure 138 below).

So, if you can master the technical skills discussed in Chapters 6 through 10 *and* you have a vivid imagination, you won't have any serious competition as a songwriter. And if you have some ambition and business skills, you'll do well commercially.

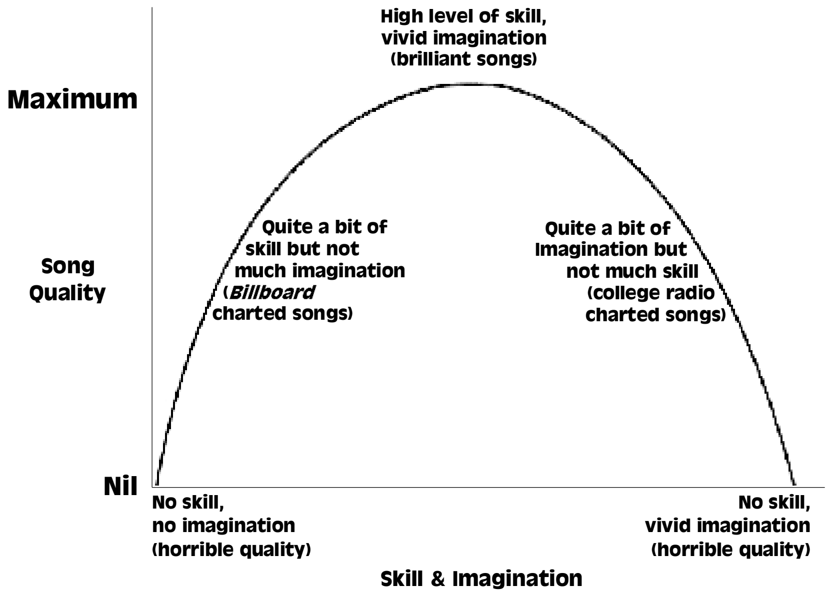
- Those with limited imagination and minimal musical and lyrical composition skill write horribly boring, tedious songs (extreme left side of Wundt curve; the songwriting equivalent of the Barnett Newman painting, "Voice of Fire"—see Section 1.3.23)

- Those with limited imagination but quite a bit of skill write mediocre songs (left side of Wundt curve; the songwriting equivalent of "wickerwork picnic baskets")

- Those with quite a bit of imagination but minimal skill also write mediocre songs (right side of Wundt curve)

- Those with a vivid imagination but minimal skill write incoherent or meandering "modern art" songs (extreme right side of Wundt curve)

FIGURE 138 Wundt Curve of Song Quality (Music *and* Lyrics): The Application of Skill and Imagination



Blind luck, buzz, and performer brand loyalty determine how songs get on mainstream and college radio charts. Song quality doesn't have much to do with it (see Chapter 12).

However, if you write brilliant songs, you don't need the charts, and you don't need blind luck. A band or performer with outstanding musical and lyrical composition skills, a vivid imagination, and a signature *vocal* (not instrumental) sound and style—yet only average instrumental ability—has an excellent chance of achieving spectacular commercial success (e.g., Hank Williams, Sr., Lennon-McCartney, Bob Dylan, Paul Simon, Bjork, Eminem).

Alas, most bands and solo performers who aspire to bigger things have their priorities exactly backwards:

- They expend inordinate time and energy improving instrumental playing skills, as well as skills in recording, and production. These skills are highest in supply, lowest in necessity.

- Vocals get second priority.

- Lastly comes songwriting. They dash off piles of songs in short bursts, or even in the studio during recording sessions. They mistake quantity for quality. Songwriting *skill* is lowest in supply, highest in necessity.

The problem is one of ignorance about song quality and how to improve it. Delusional songwriters (and music critics) view songwriting as some mysterious process, like fortune-telling or horoscope-writing. They believe you can't actually improve as a songwriter. So best not to muck with the "magic" and instead work on those things that *can* be improved, such as skill playing an instrument, skill recording and producing, etc.

2. Signature Sound and Style

Nearly every new rock, hip-hop, R & B, and country act that comes along has a performing style and sound that's highly or completely derivative of some already-famous act or acts (a musical hero or heroes). It amounts to mimicry.

Some charted acts do manage to create a signature sound and style. Critics and fans, besotted with artists' personalities, tend to confuse a signature sound and style with songwriting skill.

3. Ambition

Most acts have an abundance of ambition, motivated by the Darwinian drives that Bob Geldof lists at the beginning of this chapter.

Raging ambition will get you a long way, even if your songwriting is mediocre. In an observation of this phenomenon, Mick Jagger characterized Madonna as, "A thimbleful of talent in an ocean of ambition."

4. Music Business Knowledge and Skills

Most songwriters know far more about the business of music than the composition of songs. If you don't know much about the music business, it's pretty easy to get up to speed. It takes some time and effort, but it's not rocket science. (See Chapter 12.)

Fortunately for you, most of the millions of struggling songwriter-performers competing with you have no idea their songs are mediocre—and never will know. They also don't realize that their sound and style amounts to mimicry—and never will realize it.

So they soldier on, oblivious of their songwriting weaknesses and stylistic mimicry, and unaware of the necessity of doing something about both.

All in all, if you are willing to ...

- Take the time and effort to acquire serious musical and lyrical composition skills, and to spend most of your music-related time on perfecting those abilities, instead of obsessing about instrumental and studio skills;
- Do what it takes to create a *vocal* signature sound and style (more on this shortly);
- Focus your ambition;
- Learn about the music business and entrepreneurship (if you haven't already),

... then you should be able to carve out a most comfortable place for yourself as a performer-songwriter, with or without a band.

11.1.3 DO NOT CO-WRITE UNLESS YOU ABSOLUTELY HAVE TO

Collaborating with others to create your repertoire has several serious disadvantages:

- Your co-writer is probably clueless about effective musical and/or lyrical composition technique. If you collaborate with such a person—*even if he or she has previously written hundreds of songs*—you will probably crank out mediocre material. Obviously this does not apply if your co-writer is skilled—someone who knows pretty much everything in Chapters 6 through 10.
- If you co-write, you unnecessarily compromise your musical and lyrical composition style—your signature. The more co-writers, the tinier your signature. This defeats the purpose of having a signature.
- Co-writing unnecessarily erodes your confidence in your ability to compose effective music and effective lyrics by yourself.

- The moment even one other person's name goes down as co-writer of a song, you lose 50% of any potential songwriting income. If three of you write the song, you only get 33% of the income. If four of you write it, all you get is 25% (more on this in Chapter 12).

- You lose control over how you can market co-written songs.

It doesn't matter that most of the stuff on the *Billboard* charts is co-written. It's mediocre material. It's commercially successful for reasons that have nothing to do with song quality.

You can be commercially successful on the basis of your songwriting ability without having records that chart on *Billboard*—or anywhere else, for that matter. Next time you're thinking about co-writing, have another look at the above list of reasons not to, and think twice.

Bob Dylan has an enormous self-composed repertoire. He has rarely co-written. Even Lennon and McCartney wrote large numbers of Beatles classics *individually*. Here are a few of the many songs John Lennon wrote by himself:

"Across The Universe"
"All You Need Is Love"
"Day Tripper"
"I Am The Walrus"
"In My Life"
"Julia"
"Norwegian Wood"
"Nowhere Man"
"Revolution"
"Strawberry Fields Forever"

And a few of the many Paul McCartney wrote on his own:

"All My Loving"
"Back In The USSR"
"Fool On The Hill"
"Here, There And Everywhere"
"Hey Jude"
"I'll Follow The Sun"
"Let It Be"
"Two Of Us"
"Why Don't We Do It In The Road?"
"Yesterday"

THEME SONG OF YOUR LIFE

If you were born in 1952 or later in the UK, or in 1955 or later in America, you can find out what single was #1 on the charts on the day you were born.

If you were born before 1952, try the #1 song on your 18th or 21st birthday—"the theme song of your life." Here's the link:

www.ThisDayInMusic.com/Member/BirthdayNo1.php

Rappers: Break Away from Producers—Do Your Own Beatmaking

Before about 1960, lyricists would write the words, composers would write the music. Then along came self-sufficient acts such as Sam Cooke, Bob Dylan, The Beatles, Joni Mitchell, and countless others who wrote words and music, and also performed their own songs.

Hip-hop has reverted to the old division of labour. Producers usually compose the beats, rappers usually write the lyrics. Sometimes rappers don't even have a hand in writing the lyrics. Producers make the beats, write the words, and bring in a rapper to record the track. More often than not, entire committees work on a track.

This has several disadvantages if you're a rapper-lyricist:

- You have to depend on producers to provide you with a steady supply of fresh beats for the raps you're writing.

- You lose control over the non-lyrical aspect of your art. If you don't like the beats a producer has created for you, or if you can't fit your rhymes to them, you have no power to change the beats yourself. You have to work with the beatmaker. Or find another producer.

- You lose significant income to the beatmaker.

You don't have to put up with this. You can learn to produce your own beats. It's not difficult. Some of the biggest stars in rap produce their own beats—Kanye West and Eminem, for example.

Besides, contrary to common "wisdom," beats per se matter less than your lyrics and your vocal delivery. Some music critics may obsess over beats, but audiences care way more about your lyrics and your flow.

Not only that, if you become successful rapping to your self-produced beats, other rappers will hire you to produce.

Your producing skills will set you above the zillions of rappers who only want to rhyme and spit, and have no clue about how to use software, samplers, and related beatmaking tools.

11.1.4
STOP PERFORMING YOUR OWN SONGS IF THEY DON'T CUT IT

Suppose you're a professional or semi-professional performer with a repertoire consisting of a mix of great classics and original material.

If you haven't yet acquired the technical skills covered in Chapters 6 through 10, odds are high that your self-written songs are of merely average quality.

Stop performing them.

Instead, work on acquiring technical songwriting skills. It will take considerable work and time. After a minimum of a year or two of skill-acquisition and practice, you may be in a position to begin writing some new songs of significant quality.

In the meantime, stick with performing great classic songs. Your musical reputation will fare much better if you perform only the best songs. Don't water-down your repertoire with original songs of mediocre quality.

You'll probably find that www.GoldStandardSongList.com has the best and most comprehensive listings anywhere of quality material in all genres.

One other thing: do not perform unknown songs written by your friends. Odds are, they have minimal songwriting skills.

WANNA BE A DJ?

If you're thinking about becoming a DJ, start by reading a few good books that cover the range of DJ art, such as the one by Broughton and Brewster (see References).

"DJ" has several meanings:

1. A radio show presenter, who rarely has any control over the playlist on commercial radio, but does on non-commercial radio such as on community, public, or college radio

2. A club or party DJ who selects, plays, and mixes tracks for dancing

3. A DJ composer-producer who samples, scratches, plays, mixes, and remixes tracks to create new sounds.

To be a successful club or composer-producer DJ, you have to be highly skilled at certain things such as beat matching and recognizing song structure. So you need to have a good grasp of some of the elements of composition technique covered in this book, especially the material covered in Chapters 7 and 8.

11.2 Your Signature Sound and Style

11.2.1 HOW SIGNATURE SOUND DIFFERS FROM SIGNATURE STYLE

If you expect to be taken seriously as a performer of original material, you must develop a signature sound and style. In the context of developing your own musical signature, the terms "sound" and "style" refer to distinctly different things.

Signature Sound

Signature sound refers to the quality or character of sound, as discussed way back in Sections 3.2 and 3.3. For example, you can easily tell which instrument is which when you play exactly the same note on a piano and a guitar. When you play Middle C on a piano, the note has a distinctive "piano" signature sound to it. When you play Middle C on a guitar, the note has a characteristic "guitar" signature sound to it.

Same with two different voices. You can easily tell who's who when you hear recordings of two performers singing the same song in the same key—Ray Charles and Elvis Presley, for example. Each singer has a completely unique vocal quality—a signature vocal sound.

Signature Style

This refers to the distinctive manner in which a performer sings, raps, or plays an instrument.

Suppose somebody were to play you two recordings of "Tea For Two," each recorded in the *same key* and on the *same acoustic guitar* (so the signature sound does not change). Suppose Django Reinhardt recorded one version, and Chet Atkins the other. Without knowing the identity of either guitarist, you would know instantly that two different artists with radically different *signature styles* made the two recordings. If you had some familiarity with the music of Django and Chet, you'd know right away which artist made which recording.

Same with voices. If you were to hear Ray Charles and Elvis Presley sing the same song in the same key, you'd easily be able to recognize that, not only does each

artist have a signature *sound* to their voices, but each has a signature *style* of performing the song.

11.2.2 WHY YOU NEED TO CREATE A SIGNATURE SOUND AND STYLE

> "In humans ... neophilia is so intense that it drives a substantial portion of the global economy, particularly the television, film, publishing, news, fashion, travel, pornography, scientific research, psychoactive drug, and music industries."
>
> —GEOFFREY MILLER

Neophilia is the love of novelty, of new things. Humans are extreme neophiliacs. People crave the new and the different.

If you aspire to break away from the pack of millions of aspiring songwriters and eventually quit your job cleaning the stables at the Dodge City Horse Store, you need to appeal to natural human neophilia. You have to create two kinds of new-and-different things:

1. New songs of extraordinary quality

2. A new—i.e., unique—sound and style of performing your new songs

The perceived novelty of your signature sound and style will be directly proportional to the degree to which your sound and style mark a *departure* from the sound and style of established performers.

When you develop a signature sound and style, you are positioning yourself in a unique place in the minds of those who hear you. If your sound and style mimics some other artist's, then listeners will not perceive you as unique. So instead of carving out a new position, your sound and style will, in their brains, merely blend in with their memory of the artist or artists you're mimicking,

(Much advertising works on the principal of *positioning*. Corporations spend millions positioning themselves in the minds of consumers—the corporate equivalent of creating a unique style. It works. For example, Avis successfully positions itself as the car rental company that "tries harder." Whether it's true or not, people believe it. Chapter 12 discusses the findings of an interesting study of the decisions consumers make based on the brand positioning of Coke vs Pepsi.)

If you have:

- Brilliant new songs, but a style that mimics an established performer, or

- A unique sound and style, but mediocre songs

you still might be able to make a go of it as a performer of original material. But you'll have a far easier time if you get both your songs and your signature right.

11.2.3 ELEMENTS OF YOUR SIGNATURE SOUND AND STYLE

Here are some of the elements of your signature sound:

- The characteristic sound of your voice—by far the most important signature sound element
- The characteristic sounds of your backup or harmony vocalists
- The sounds of the chosen musical instruments you and your band mates play, either live or on record
- The sounds of electronic effects, samples, etc. that you use in your live act or on record

And some elements of your signature style:

- The characteristic features of the music you compose (A study of anonymous test samples of classical compositions revealed that it was easy to tell whether the music was composed by Mozart or Beethoven or Haydn, *just from the first few notes* of a given piece of music. When you write an original song, you create a compositional signature. Recall, for example, Neil Young's songwriting habit of beginning vocal-melodic phrases *after* beat one of bar one—Section 8.2.5.)
- The characteristic features of the lyrics you write
- The characteristic manner of your vocal delivery; if you rap, the characteristics of your flow
- The characteristic manner of your harmony vocalists' delivery
- The characteristic manner in which each musician plays his or her instrument

11.2.4 DEVELOPING YOUR SIGNATURE: RECOGNIZE MIMICRY

> If you can't imitate him, don't copy him.
> —YOGI BERRA

As you know, great songwriting does not materialize out of thin air. You need a lot of specific skills, *skills you can learn*. If you don't learn those skills, you simply will not write great songs consistently.

The same applies to developing a signature sound and style.

According to conventional wisdom, you either have a unique style or you don't—you can't *create* your own signature.

Rubbish.

Every musician and songwriter starts out as a mimic. It's called *imitation learning*, and it's natural, thanks to the activity of the brain's *mirror neuron* system. It's the same reason emotions are contagious and people have the ability to empathize.

Musically, you have to work at breaking away from mimicry, to create a signature sound and style (unless, of course, you aspire to be an Elvis impersonator or play in a Queens of the Stone Age tribute band). Like practically all musicians in popular music, you probably learned to sing and play by example from recordings of favourite artists. "Play by example" means you *copied* their vocal and instrumental sound and style. As a fan, you tend to mimic your musical heroes. Not only their vocal sound and style, but also their facial expressions, gestures, style of dress, hair style, etc.

Developing a distinctive, signature sound ain't easy. For instance:

- Bob Dylan in his late teens sounded like Woody Guthrie, then Ramblin' Jack Elliott, before he developed his signature vocal sound and style
- Howlin' Wolf sounded like Charley Patton
- Joe Cocker sounded like Ray Charles
- Ray Charles sounded like Charles Brown
- Ellie Sue sounded like Charlie Daniels

That's why you need to force yourself to listen to, and absorb, music from "foreign" genres, and from other eras of popular music. (Think of musical genres other than the one you usually work in as "foreign," in the same way other languages

are "foreign." Languages and musical genres both function as cultural infrastructures. See Section 2.5.)

GETTING SUED: THE ULTIMATE RECOGNITION OF AN ARTIST'S SIGNATURE SOUND AND STYLE

John Fogerty wrote all of Creedence Clearwater Revival's classic songs. Unfortunately for Fogerty, his record label at the time was Fantasy Records, owned by Saul Zaentz. Fantasy owned (and still owns) the rights to John Fogerty's Creedence songs.

When Fogerty left Fantasy for a solo career, that was the end of Creedence. However, Saul Zaentz wasn't happy when he heard Fogerty's solo records. Zaentz sued Fogerty for sounding too much like ... like ... *John Fogerty* on Creedence recordings. Fogerty was being sued for sounding too much like himself!

The case dragged on for years. In the end, Fogerty demonstrated in court that, when you have a unique sound and style, well, dang it, *all* of your recordings are going to have your signature sound and style. That's why it's called a *signature*, for cryin' out loud.

The court agreed with Fogerty and threw out the lawsuit.

11.2.5 DEVELOPING YOUR SIGNATURE: LOCATE YOUR COMFORT ZONE ON THE "MAP" OF POPULAR MUSIC

Spend a week or two walking around with a pen and paper in your pocket, thinking about your favourite songs of all time. Your own personal favourites. As the titles come to mind, jot 'em down:

- Songs you first heard on the radio or MTV when you were growing up
- Songs you may have learned from siblings and parents

- Songs you learned from your friends and peers

- Songs you may have discovered by plundering someone else's CD collection or vinyl record collection or iPod

- Songs of any genre that you learned at any time in your life, that have remained with you

In the course of doing this, do not consult any charts or lists of songs. Especially not the *Gold Standard Song List*. (Not yet.)

Make sure all of the songs on your list are songs *you personally* really love: songs that excite you, scare you, sadden you, or otherwise move you emotionally.

Don't stop until you've accumulated a pretty sizable list of tunes—at least a hundred titles, preferably more. The more the better.

When you've finished your list, see how many are listed on the *Gold Standard Song List*:

* Go to www.GoldStandardSongList.com and print out the fast-search procedure on this page:

  www.GoldStandardSongList.com/Pages_Basics/How_to_Fast-Search.html

* Then go to the list itself and click on the "SORT BY Song Title" tab. Use the fast-search procedure to find titles on the GSSL that match titles on your list. *Follow the procedure from your print-out carefully*, or you'll miss some songs on the GSSL. See how many songs on your list match songs on the GSSL.

* For each match you find, make a note on your list of the *genre* and *year*.

Next, assuming you've found at least some matches between the songs on your list and the songs on the GSSL:

- Click on the "Sort By Genre" tab and print the page

- On the printout of the table, put a little check mark in the appropriate square matching the genre and decade of each song on your personal list that you found on the GSSL

When you're done, your printed-out table will have anywhere from a few check marks to as many as 60 or 70 or even more (assuming you started with a list of 100 of your favourite songs).

The genres and decades where the check marks cluster show your personal musical comfort zone with respect to the big picture of popular music in the English-speaking nations.

You can use the information on your "comfort zone map" in conjunction with the GSSL to address the central problem of developing a signature sound: pay attention to those areas on your map that are *outside your musical comfort zone*—that have few or no check marks.

What If You Did Not Find Any Song Matches on the GSSL?

Suppose you've got a hundred song titles on your list, and you could not find any of them on the *Gold Standard Song List*. Several explanations could apply:

- You are not using the fast-search method correctly
- Your connection to the Internet is so slow that you're still waiting for the "SORT BY Song Title" web page to load (it's the only page that has all 5,000 GSSL songs)
- You're a recent immigrant from a non-English-speaking country and have never heard of The Beatles, 2Pac, Joni Mitchell, Cole Porter, Hank Williams, Sr., or Tom Waits
- You're from an English-speaking country, but your taste in music is 180 degrees removed from the tastes of most of those in the society that surrounds you. If this is the case, maybe a career in popular music isn't for you, and you may wish to pursue a career in *unpopular* music

11.2.6 DEVELOPING YOUR SIGNATURE: USE THE GSSL TO GET OUT OF YOUR COMFORT ZONE

As with composing great music and writing great lyrics, developing your signature entails venturing out of your comfort zone.

The GSSL is a gold mine for you to use in developing your signature sound and style. Here's why:

- The songs and performers are *sorted by genre*. This is important, because you will need to familiarize yourself with recordings from *genres other than your own* if you expect to develop a signature sound and style.

- The GSSL provides a *100-year time perspective to work with*. Again, this is vitally important because you will need to familiarize yourself with earlier musical eras in popular music.

- The GSSL is a sorted resource of brilliant songs and performers. Since nearly all of the performers listed have a signature sound and style, you can go after specific tracks and get new ideas from the world's best popular musicians.

For example, you may discover a track on the GSSL that features a style of singing or combination of instruments that were used 70 years ago in a genre that's foreign to your musical experience. You may find the sound so intriguing you may want to adapt it for your sound or style.

This is the kind of thing that leads to the creation of new signature sounds and styles that capture the attention and imagination of neophiliac audiences, music critics, and music industry people.

If you listen to enough music from outside your comfort zone—from those areas without checkmarks on your map—you will absorb new sounds and new elements of style that will replace hero-mimicry and enable you to forge your own signature sound and style.

Suppose you're a shoe-gazin' folkie. Try absorbing some jazz. You never know where it'll take you. Joni Mitchell, who started out as a folk singer and songwriter, eventually found herself steeped in jazz. She even collaborated on an album with Charles Mingus, one of the titans of jazz.

Here are a few specific examples of artists dipping into other genres:

- In 1998, hip-hop artist Jay-Z did a hugely successful rap re-write of "It's A Hard-Knock Life," from the 1977 musical *Annie* (about little orphan Annie), which he titled "Hardknock Life (Ghetto Anthem)."

- In 1999, continuing to explore songs from musicals, Jay-Z did a rap re-write of "I'd Do Anything" from the 1960 musical *Oliver*. Jay-Z's version is called "Anything."

- As mentioned in Chapter 2, The Beatles' *Sgt. Pepper's Lonely Hearts Club Band* album (1967) has all the stylistic hallmarks of the British music hall tradition, a genre dating 50 to 100 years before *Sgt. Pepper's* was recorded.

- The Beatles, always musical adventurers, introduced the sound of the sitar to Western popular music in the 1960s, and also introduced a sitar master from India named Ravi Shankar to large Western audiences.

- In 1999, the punk band Me First and the Gimme Gimmes recorded a cover of the Broadway show tune, "Tomorrow" (aka "The Sun Will Come Out Tomorrow"), also from the 1977 musical *Annie*.

- In 2004 Gwen Stefani released a dance re-write of "If I Were A Rich Man," from the 1964 musical *Fiddler On The Roof.* Stefani's version is called "Rich Girl."

Whether your main genre is hip-hop, punk, country, rock, R & B, jazz, metal, or dance/electronica, the more you explore other genres, especially the vocal sounds and styles of other genres, the more likely you will develop a distinctive, signature sound and style, and create adventurous, interesting music.

You will have to work a lot harder at defining your signature sound and style if:

- You co-write your songs instead of writing all of your own lyrics and music (co-writers will dilute your signature songwriting style)

- You don't write *any* of the material you perform

- You don't sing; you only accompany someone else's vocals

- You sing, but another musician or a band accompanies you instrumentally

11.2.7 DEVELOPING YOUR SIGNATURE: CONCENTRATE ON YOUR *VOCAL*—NOT INSTRUMENTAL—SOUND AND STYLE

That's my style, man.
—NEIL YOUNG

Neil Young was replying to producer David Foster who suggested the singer's vocal was a little flat, and could he do it again? (Young was one of a large number of Canadian artists who collaborated on the Foster-produced recording of a song to raise funds for Ethiopian famine relief in 1985. The song was, "Tears Are Not Enough." The UK equivalent was "Do They Know It's Christmas." The Americans recorded "We Are The World.")

Unless you happen to be an extraordinarily gifted instrumental virtuoso, your signature sound and style will centre on your voice: the *sound of your voice* and the *style of your vocal delivery.* Given the choice, audiences prefer to listen to songs with words,

not instrumental music. In the history of popular music, many musicians who began as instrumentalists did not break through until they added vocals (e. g., Nat King Cole, George Benson, Diana Krall).

Here are the main reasons vocals rule popular music:

- ***The voice is THE fundamentally human musical instrument.*** Every human being is born with his or her own unique vocal apparatus. Everybody identifies with the sound of the human voice in a primal way.

- ***Only the voice can convey the emotional power inherent in lyrics***—assuming well-written, high-EPA lyrics.

- ***The voice is capable of far more sonic variety than any other musical instrument.*** When you play an acoustic guitar or piano, the sound you get equates to the sound of the human voice singing a single syllable. A guitar has its "guitar" sound, and a piano has its "piano" sound, and that's that. If you want a piano or guitar to sound like something else, you have to use electronic devices to modulate the sound. By contrast, you can use your voice to effortlessly create a bewildering variety of vowels and consonants. The range of emotionally meaningful sounds you can create with the voice dwarfs all other musical instruments, including computers.

With all of the above elements in play at once, nothing else comes close to the human voice as the instrument most capable of engendering an emotional response in an audience.

Table 76 lists a sampling of musicians representing *11 different popular music genres*. Each artist is noted for having a well-defined signature sound and style. Nearly all of these performers are *vocalists:*

TABLE 76 Signature Performing Elements of 55 Great Artists in 11 Genres

Genre	Performer	Main Signature Sounds & Styles
Blues	B. B. King Bessie Smith Muddy Waters Robert Johnson Stevie Ray Vaughan	Guitar, vocal Vocal Vocal Vocal, guitar Guitar, vocal

Country/ Bluegrass	Dolly Parton Iris DeMent Hank Snow Lyle Lovett Willie Nelson	Vocal Vocal Vocal Vocal Vocal, guitar
Dance/ Electronica	ABBA Bjork Moby New Order Tricky	Vocal harmony Vocal Electronic instruments, vocal Electronic instruments, vocal Vocal, electronic instruments
Folk/Roots	Gordon Lightfoot John Prine McGarrigle Sisters Stan Rogers Woody Guthrie	Vocal Vocal Vocal harmony Vocal Vocal
Gospel	Blind Boys of Alabama Joseph Spence Mahalia Jackson Sister Rosetta Tharp Soul Stirrers	Vocal harmony Vocal, guitar Vocal Vocal, guitar Vocal harmony
Hip-Hop	2Pac A Tribe Called Quest Lauryn Hill Missy Elliott Ol' Dirty Bastard	Vocal Vocal Vocal Vocal Vocal
Jazz	Billie Holiday Charles Mingus Charlie Parker Diana Krall Fats Waller	Vocal Bass Alto sax Vocal, piano Vocal, piano
Musical/Film	Barbra Streisand Bing Crosby Judy Garland Marlene Dietrich Noel Coward	Vocal Vocal Vocal Vocal Vocal
R & B/Soul	Aaron Neville Boys II Men Ray Charles Sam Cooke Stevie Wonder	Vocal Vocal, solo and harmony Vocal, piano Vocal Vocal, keyboard, harmonica

Reggae	Beenie Man Bob Marley Burning Spear Jimmy Cliff Shaggy	Vocal Vocal Vocal Vocal Vocal
Rock	Alanis Morissette Elvis Costello Jimi Hendrix Lou Reed Nirvana	Vocal Vocal Guitar, vocal Vocal Vocal

Outside of jazz and dance/electronica, comparatively few musicians succeed in creating a purely instrumental signature (e. g., Floyd Cramer did it in country, Carlos Santana in rock). The musical reputation of rock's greatest guitar player, Jimi Hendrix, rests almost as much on his vocal sound and style as on his guitar playing.

For the most part, it's your vocal quality and style that identifies your uniqueness as a performer in the minds of most listeners, not your instrumental playing. To develop a signature vocal sound and style, you need to assimilate vocal styles outside of your comfort zone, from a variety of foreign genres, and from earlier periods of popular music history.

You can use the *Gold Standard Song List* to pinpoint exactly which songs from which genres and which decades you'd like to explore.

It's highly unlikely your new sound and style will be derivative of the genre-foreign performers you explore because you won't accumulate enough experience over a long enough period of time for that to happen. But you'll acquire enough to absorb new sounds and techniques from the foreign genres that your vocals and/or instrumental playing within your "home" genre will mutate and develop into a distinctive, signature sound and style.

You need not attempt to explore every song on the *Gold Standard Song List.* The list is much larger than it seems on the website. If you were to listen to 10 different GSSL songs every day, it would take you 500 days—more than 16 months—to listen to all 5,000 songs only once!

Just use the GSSL as a resource to pick and choose songs from genres and eras that lie outside your musical comfort zone, and that seem intriguing by their titles, songwriters, dates, and artists who have recorded them.

Get the recordings and listen to them repeatedly, with an open mind. Experiment with playing or singing or rapping some of the material, even if the vocal styles and instrumentation seem entirely out of place with respect to your comfort-zone genre.

Once you develop an appealing, distinctive, vocal signature, you can use it to perform well-written, compelling original songs, *not just in one genre of popular music, but in several different genres.* Lots of heads will turn your way, as they did for every one of the artists in Table 76.

WHY DO YOU LOSE YOUR SPEECH ACCENT WHEN YOU SING?

It's a puzzling phenomenon: a performer with a pronounced southern drawl or a thick Scottish brogue loses his or her accent when singing. Not all the time, of course, but usually. How come?

Exaggerated tone production masks the accent. Here's an analogy:

Suppose one of your legs is an inch shorter than the other, so you walk with an unusual gait, compared with people who have same-length legs. Your gait is your walking "accent". However, even though you have an unusual walking gait, you have no problem learning to dance. Anyone watching you dance would not know you had an unusual walking gait, because when you dance, your body moves differently. When you dance, you *exaggerate* body motions, which masks your walking gait.

Singing is heightened speech, or exaggerated speech, the way dancing is exaggerated walking. When you sing, you use your voice differently, compared with speaking. You hold vowels much longer, raise and lower pitch differently, and leave long pauses between phrases. The overall effect is to mask your speech accent.

11.2.8 VOCAL TECHNIQUE FOR SINGERS AND RAPPERS: 10 GUIDELINES

You already have a unique sound to your speaking voice. But if you're like most musicians, when you sing, you veer towards mimicry of a well-established vocalist whose sound and style you admire.

To begin to get away from mimicry, approach singing as *heightened speech*, which is exactly what it is. Since you already have a unique speaking voice, here are 10 guidelines that you may find helpful in carrying the uniqueness and natural sound of your speaking voice over to your singing voice.

RAPPERS: Nearly everything in this section applies to both singing and rapping.

1. Clear Your Throat

Caruso is said to have spent 15 minutes before a practice session or a performance, just clearing his throat. That may be going a bit far, but you do need to take a few minutes to do this before you start singing or rapping. It's noisy, but necessary. Drinking plain water helps.

2. Keep Your Jaw, Neck, Shoulder, and Abdominal Muscles Relaxed

When you talk, you don't tense up those muscles. Don't do it when you're singing or rapping, either. The more you involve your jaw, neck, shoulder, and abdominal muscles, the more you'll sound like somebody else—not yourself.

3. Keep Your Head Slightly Down

Try this. Stand up. Look straight ahead, as though you're talking to somebody the same height as yourself. Relax your jaw completely. Let your jaw drop by the force of gravity only. Now you're standing there with your jaw hanging down, looking as though you just saw the real Elvis, who drives a taxi in Muscle Shoals, Alabama. With your jaw hanging down, bend your head slowly down (not forward, *down*) until your top teeth meet your bottom teeth. Now your head is bent slightly down, as though you're on stage, singing or rapping to those in the front row.

When you sing, keep this head position with respect to the rest of your body, even when you lean back as you sing or rap. This position will help prevent you from tensing your jaw and neck muscles, which is what happens when you throw your head up and back.

4. Keep Your Lungs Full, Like Inflated Balloons

When you speak, your lungs are relatively deflated, like flaccid balloons. They don't have nearly as much air in them as they're capable of holding. When you sing or rap, you need *full lungs for the duration of the song*. Two blown-up balloons in your upper chest. Air pressure powers your voice. You need more air pressure for singing than you do for speaking because you sing *louder* and at *higher pitches* (mostly) than you speak.

Before you launch into the first phrase of a song, allow several seconds to fill your lungs with as much air as you can take in, as though you're about to submerge your head in water for the next four minutes. Whatever you do, keep your abdominal muscles completely relaxed. If you tense them, you'll stop yourself from breathing properly. To power your singing or rapping voice, let air slowly out of your over-

filled lungs, the way you'd let air out of a full balloon. Between phrases, top up your lungs. Keep those balloons as fully-inflated as possible throughout the song.

RAPPERS: You have to deliver a lot more syllables per minute, and have shorter breaks between phrases. Make sure you know exactly where in your flow you're going to top up your lungs.

5. As Much as Possible, Keep Your Mouth Shut

Not completely shut, of course, but mostly shut. Again, when you're speaking, your jaw moves little, and your mouth does not open widely. It's mostly closed. Do the same when you're singing or rapping. Don't open your mouth wide, as though you're yawning. The less you involve your jaw muscles, the better.

And don't clench your teeth.

6. Recognize Your "Chest Voice" and Develop It

When you talk, you normally use the lower tones of your vocal range. As discussed in Chapter 3, to produce low tones, voices and musical instruments require larger resonators. When you speak, sing, or rap low-register notes, your trachea (the airway tube extending from the bottom of your larynx downwards) and chest cavity are involved in amplifying your vocal-fold vibrations.

Put your hand on your upper chest and talk normally. You'll feel the vibrations. When you rap or sing low notes, the sound seems to emanate from your upper chest. When you sing or rap loud lower-register tones, you should be able to feel strong vibrations in your upper chest. If you don't, you need to work on your chest voice.

Without a strong chest register, your singing or rapping voice will sound thin, small, and insignificant—lacking in force and authority.

The most natural-sounding vibrato, by the way, sounds as though it's chest-centred. Your diaphragm is a dome of muscle at the bottom of your rib cage in your upper chest. It separates your thoracic cavity (which holds your heart and lungs) from your abdominal cavity. When you take a deep breath, your diaphragm moves downwards, your lower ribs expand outwards as air rushes into your lungs, inflating them.

As long as you hold your diaphragm down, your lungs stay inflated. When you sing, you let air out in a *controlled manner* (i.e., not in blast), producing pressure against your vocal folds. This causes two things to happen simultaneously:

- Your vocal folds vibrate, producing a note or tone
- Your vocal folds *ripple (alternate between bursting open slightly and closing together) as they vibrate*, producing vibrato

If you hold your vocal folds together strongly, the air pressure originating with your diaphragm will not be powerful enough to cause the ripple effect, and you will sing without vibrato. But if you relax your vocal folds just enough, the ripple effect will come into play and you'll produce vibrato.

Vibrato happens naturally at a rate of about six pulses per second (plus or minus one) and feels as though it's *chest-centred*, not throat-centred. The resonance in your chest cavity makes it feel as though your diaphragm is causing the pulsing effect (it's not). Your jaw, and the area under your jaw and your neck should all be relaxed, and should not wobble when you produce vibrato.

7. Recognize Your "Head Voice" and Develop It

When you sing higher notes, the pharyngeal cavity at the back of your mouth (just above your larynx), and other cavities in your head, are involved in amplifying your vocal fold vibrations. Put your fingers on your upper jaw, at earlobe level, and sing some higher notes or speak at a high pitch. You should be able to feel the vibrations. If you don't, you're probably tensing *muscles* in your jaw and neck.

There's an easy test to determine whether you're singing or rapping with naturally relaxed muscles: ***your Adam's apple should not move.***

- Put your finger on your Adam's apple, also known as your thyroid cartilage. (Both men and women have an Adam's apple, but in women, it does not jut out of the neck because it's considerably smaller. The reason is that, at puberty, the larynx does not enlarge in girls. But in boys, it begins to enlarge substantially, causing a lowering of the vocal register. In males, the larynx grows so large that part of it, the thyroid cartilage, juts out of the neck. In adult males and females of the same height and weight, the male voice is lower because of the enlarged male larynx.)

- Move your finger from your Adam's apple to just above your Adam's apple. You'll feel a gap about as wide as the end of your finger.

- Above the gap is a small bone, your hyoid bone. It connects to your Adam's apple via a membrane called the hyothyroid membrane. This membrane is recessed, so you can stick your finger in the gap between your Adam's apple and your hyoid bone (hyothyroid gap).

- When you swallow, the hyothyroid gap closes up—your Adam's apple moves up.

- When you sing or rap with good technique, your hyothyroid gap should remain *open*, just as it stays open when you speak. That is, your Adam's apple should not move.

- If you sing or rap with tense neck and jaw muscles, the hyothyroid gap *closes*. Your Adam's apple moves up tight to your hyoid bone. *This is not good technique* because it effectively stops you from breathing (which is exactly what happens when you swallow food or take a drink, preventing you from choking to death).

- Try singing or rapping with your finger in the hyothyroid gap. If the gap closes up when you sing, especially higher notes, you are tensing your neck and jaw muscles. Your technique needs improvement.

8. Recognize Your Falsetto and Develop It

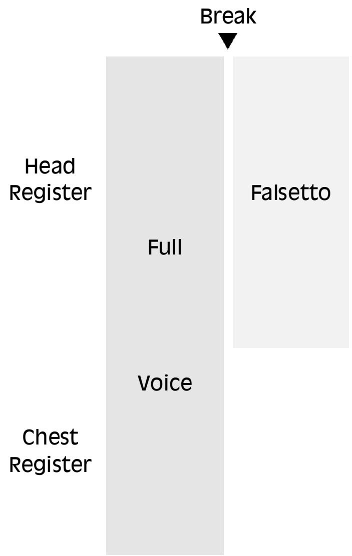
You can use your head voice in two ways. Normally, you sing higher notes *full voice*. Your vocal folds are close together. But if you *relax* your vocal folds and they come apart, you produce same-frequency *falsetto* tones. That is, you can produce *the same* high-register notes in either full-voice or falsetto, depending on whether your vocal folds are close together (full voice) or apart (falsetto).

If you sing up the scale from chest register to head register at full voice, keeping your vocal folds close together, you'll experience a smooth transition from low notes to high notes. But if you *relax* your vocal folds as you move from chest register to head register, you'll jump into falsetto.

If you haven't had a lot of vocal practice, you will probably experience a break in your voice as you sing up the scale from your chest voice to your head voice. That's caused by momentarily relaxing your vocal folds in your higher register and jumping from full voice into falsetto. If you do this deliberately as a characteristic of your vocal style, that's fine, because you're in control. But if it happens unexpectedly because you're not in control of your vocal technique, it'll sound funny.

Figure 139 below shows the relationship between full voice and falsetto:

FIGURE 139 Full Voice and Falsetto



A lot of mainstream singers play it safe and never use falsetto. But falsetto, especially in men, can sound remarkably emotional and expressive. Falsetto sounds edgy because singers who use it push the limits of vocal expressiveness, and audiences sense that. Soul, R & B, blues, rock, country, and gospel singers have always made use of falsetto (e.g., Aaron Neville, Marvin Gaye, Bobby McFerrin, the Bee Gees, Jimmie Rodgers, Wilf Carter). If it's not something you've tried, have a go at falsetto and incorporate it into your vocal style.

Usually, you cannot produce true falsetto tones at low chest voice frequencies. However, you can jump directly from chest register up to falsetto. When you quickly switch back and forth between full voice—especially chest voice—and falsetto, that's yodelling!

HELP FOR ASPIRING YODELLERS

If you just can't seem to get the hang of yodelling no matter how hard you try, help is at hand.

You can get yourself a yodelling T-shirt.

Ms Puma bought one for Marshal McDillon, who uses it to break up fights outside the Wrong Ranch Saloon on Saturday nights.

The yodelling T-shirt comes from Austria, a country renowned for its skiers and yodellers. And Mozart. And beer.

Here's the shop:

www.JodelAndMore.com

Note that "yodel" is spelt with a "j"—"jodel." Click on the "English" button for charming Austrian English.

9. Slur Notes, Not Words

In singing, you normally step from note to note in discrete pitches. But for expressiveness, don't be afraid to slur sometimes. "Slurring" here does not mean to sing as though you've had six margaritas. Slurring means moving smoothly, instead of stepwise or leapwise, from one note to another, upwards or downwards. Van Morrison and George Jones, two of the greatest singers in popular music, have signature slurring vocal styles. A lot of country singers slur. Some rappers also slur a lot. Slurring downwards, one characteristic of Dylan's vocal signature style, creates an impression of authority and confidence.

Some singers who slur slightly but unintentionally, rely on *autotuners*, electronic devices that automatically correct a singer's pitch during concerts and on records. Pop stars use them: Britney Spears, Shania Twain, Cher, Reba McIntyre, and many others. So do singers in punk bands.

If you can't sing on pitch very well, your listeners will forgive you if you write brilliant songs and have a signature sound and style: Neil "That's my style, man" Young, Bob Dylan, Kris Kristofferson, Lou Reed, Jim Morrison, Johnny Cash, to name a few.

If you think you need an autotuner, then maybe a career as a singer isn't for you.

10. Warm Up

Your vocal folds, being muscles, need some preparatory exercise and conditioning before they'll respond optimally. Do 15 to 30 minutes of full-voice warming up before you perform.

11.2.9 THE INSTRUCTIONAL VALUE OF THE *IDOL* TV SINGING CONTEST

In addition to having lots of laughs, you can learn quite a bit about effective (and ineffective) vocal technique by watching your nation's franchise of the *Idol* TV singing contest. You can also learn something about developing a vocal signature sound and style.

- You get to see and hear an incredible spectrum of singers, from vain and delusional off-key screamers to genuine vocal artists.

- You get to hear brutally honest feedback from one of the judges. In whichever version of *Idol* you watch, the panel of judges includes one judge worth listening to. That "nasty" judge says what most people (including the "nice" judges) usually would not say to a contestant's face. If you're a performer, you can learn much from such frank criticism, especially when it focuses on uniqueness of vocal style—or lack of it.

- You get to hear singers attempt renditions of songs outside their comfort zones. How well, or poorly, they adapt can be most instructive.

NODOJIMAN: THE ORIGINAL TV SINGING CONTEST

Long, long, long before *Pop Idol* or *American Idol*, there was *Nodojiman*. The Japanese word means "throat pride" or, loosely translated, "good singer."

Nodojiman has been a popular Sunday institution in Japan since 1945, and is still going strong. The program's format has some similarities to *Idol*. An MC introduces 20 contestants and each sings one song (actually only a short segment of one song). The winner goes on to the next level.

Nodojiman travels around Japan and around the world. So, if the *Idol* judges have shown you the door, keep an eye out for the venerable *Nodojiman* and try your luck there, the next time the show comes to your neighbourhood. It might be a good idea to brush up on your Japanese if you expect to have a shot at the finals and eventual superstardom.

11.3 Performing Live

11.3.1 Mental Practice

> Mental practice is the imagined rehearsal of a motor act with the specific intent of learning or improving it, without overt movement input.
>
> —ALVARO PASCUAL-LEONE

As you know, stepping out on stage without being adequately prepared invites disaster. Only practice (and perhaps a beta blocker) ensures confident, un-self-conscious performance.

But it's not necessary, or even desirable, to restrict practice to conventional practice sessions. You can also practice mentally. How? By performing the song over

and over in your mind, without going through the physical motions. By singing the tune, by getting all the words right, by playing the chord changes, over and over and over, in your mind.

When you sing a song or play a piece of music on a guitar or other instrument, you're using long-term procedural memory. The more times you repeat a procedure, the more reflexive it becomes. "Force of habit."

The elements of a procedure you've memorized are linked to each other in sequence. Suppose you've memorized the Frost poem "Stopping By Woods On A Snowy Evening" and someone asks you to recite the *third* verse. What would you do? In your mind, you'd start at the beginning of the poem and race through the first two verses in sequence. Only then, having "found" the third verse, would you be able to recite it.

Problems can arise when something goes wrong somewhere in the execution of the recollected sequence. Unless you know a song inside out, the sequence can easily go off the rails.

There you are, playing a song for the first time in front of an audience. A song you've played flawlessly in the absence of an audience. Now, with all those people staring at you, you become self-conscious, conscious of your playing, instead of allowing your procedural memory to handle the sequence. So you screw up the performance.

If you watch the *Idol* TV singing contest, you see this all the time. In the presence of judges, audiences, and cameras, a contestant becomes frightened and self-conscious, and forgets the words—and sometimes the tune, too.

To prevent a performance disaster, you have to ensure that you've embedded your performance so deeply in procedural memory that no amount of pressure could thwart your execution of the sequence.

For example, practically everyone could recite the alphabet or tie their own shoes, even in front of a large audience with judges in Row One. That's how ingrained and FUBAR-proof a performance needs to be. As automatic as ABC.

Historically, some of the world's greatest musicians—Vladimir Horowitz and Anton Rubinstein, for example—used the technique of mental practice to maintain their astounding skill levels. Modern-day musicians use the same technique.

Imagine yourself in front of an audience, singing and playing a song. Mentally rehearse the whole set. Imagine every lyric line coming out in the right order, with the right expression. Imagine your fingers changing every chord in the correct sequence.

Physiologically speaking, memory is "the ability of nerve cells (neurons) in the brain to alter the strength and number of their connections to each other in ways that extend over time." When you're mentally practising, you're making neural connections in your brain, in your procedural memory.

During a mental practice session, if you're unsure of a melodic passage or a verbal phrase or a chord change, stop. Go over the lead sheet or lyric sheet or sheet music or whatever you're using and get it right. Internalize it well. If you're still

uncertain, sing it or use your musical instrument to work out the passage until you're absolutely certain you've dealt with the problem. Then go back to mental practice.

It's important to understand that memorizing a song works best if you understand the structure of the song and memorize it in *chunks*, rather than note by note. Get a phrase right, then a period, then a whole verse or chorus.

The beauty of mental practice is that you can do it in places and situations that are not conducive to practising with an instrument, such as on the subway or in the bathtub.

Mental practice takes effort, but it works. It forces you to concentrate completely on the details of the song. On getting every element nailed down firmly in your procedural memory. Eventually, you'll be able to sing and play the whole set through mentally with such automatic ease that it's like tying your shoes or reciting the alphabet.

Now you can trust the mechanics of lyric recall and melodic intervals and chord changes to your procedural memory. You're free to focus on performing the song in the moment, with expression and soul. An audience identifies with the performer, so the more confidently you perform, the better. It'll show.

11.3.2 SOME COMMON PERFORMING PROBLEMS

Some of these may apply to you—or none.

- ***Performing in an emotionally uninvolving style.*** Stage fright often causes this. Being completely prepared can free you to be as expressive as you want to be. (see Section 11.3.1). If you use a beta blocker, you might not have sufficient nervous energy to deliver an emotionally involving performance.

- ***Performing in a precise, correct, note-perfect, mechanical style.*** Classically-trained singers and players, for example, who try to cross over to popular music, often sound stiff and ridiculous. They're used to sight-reading the notes exactly as they appear on the page and have problems assimilating certain substantive elements of popular music performance, such as syncopation and improvisation.

- ***Performing in an over-the-top, histrionic style.*** Many amateur R & B vocalists and rock singers do this. It looks phony and it sounds phony.

- ***Not enunciating clearly when singing or rapping.*** If your audience can't make out the words, you might as well sing or rap in Inuktitut or Swahili. Poor enunciation simply destroys lyrics. It's okay to do this after you've made your

millions. Your legions of fans will always buy your records, even if they can't make out what you're saying. Otherwise, lousy enunciation is just plain dumb. For a lesson in clear diction, listen to some of the jazz greats, especially Frank Sinatra's remarkably clear "conversational" vocal delivery.

RAPPERS: Speed kills intelligibility. What's the point of spitting 800 syllables a minute if nobody has the slightest idea what you're saying? It amounts to a gimmicky display. The novelty wears off pretty fast.

> I would my horse had the speed of your tongue.
> —SHAKESPEARE (*Much Ado About Nothing, I, i*)

- ***Singing or rapping in a language that the majority of the audience doesn't know*** (e. g., singing or rapping in French to an audience in Seattle). Claims that "the French language sounds so sexy" or "the Spanish tongue sounds so beautiful" amount to rubbish. If your audience doesn't know the language, all they hear is gibberish. If you think the "wonderful" sound of your foreign language somehow conveys the meaning of the foreign words to your audience, you're delusional. All your audience actually hears is meaningless babble.

11.3.3 KILL TEDIOUS STAGE PATTER

"Here's a little song I wrote about ... blah blah blah ... we should all promote peace and understanding ... blah blah blah ... give up some love ... blah blah blah ... are you ready to rawwwk? ... blah blah blah ... I was playing a club in Peoria and ... blah blah bhah ... don't be cheap with the applause ... blah blah blah ... my mom's cookies ... blah blah blah ... you're a wonderful audience ... blah blah blah ... put your hands together for ... blah blah blah ... hope you enjoy this song which I wrote ... blah blah blah ..."

Please don't do this—unless your songs are mediocre and you rely on forming a personal relationship with your audience to make your act interesting.

Major labels expect the acts they sign to focus on forming personal connections with fans (more on this in Chapter 12). A major label star constantly talks to the audience and urges audience participation in songs. Yakking between songs is perfectly fine if you perform the kind of unimaginative "wickerwork" songs that fill Clear Channel type commercial radio playlists, *Billboard* charts, and set lists of big-selling country and rock acts. For such acts, it's all about spectacle, showmanship, and personality, which help compensate for the lack of imagination inherent in the music and lyrics of the songs.

Suppose you manage to write some genuinely brilliant songs, and develop a signature sound and style. Indulging in trivial, low-EPA stage patter will detract from your high-EPA lyrics and your performance.

When you perform, you're an actor, an interpreter of the lyrics and music. For your audience, listening to stage patter between songs is like listening to the lead character in a play go out of character every few minutes to yak to the audience about banalities that have nothing to do with the play. That's fine if the songs don't really matter and your aim is to entertain the folks with flashy visual spectacle and good-time razzle-dazzle showmanship.

But if the substance of the songs do matter, resist the temptation to become one with your audience. Just perform the dang songs and let the songs and your performance say everything.

A few exceptions:

- If you're one of several acts and nobody knows who you are, tell them who you are at the beginning and at the end of your set

- Sometime during the set, introduce the members of your band

- If you have something to sell, especially CDs, let them know

11.3.4 INTELLIGIBILITY MATTERS: IF THEY BURY YOUR LYRICS IN THE MIX, YOU LOSE

One of the stupidest preventable mistakes you can make is allowing your vocals to get buried in the house mix. Nearly all performers make this blunder most of the time.

In a hip-hop act, the beats usually get cranked to the point where the MC's words get thumped and become unintelligible. In a rock act, the drums and guitars dominate the mix and murder the vocals.

A live mix that drowns out the vocals becomes merely an instrumental mix. With the vocal level mixed too low, nobody in the audience can make out the words, even when the vocalist is shouting at the top of his or her lungs.

When you allow beats or drums or guitars to smother the vocals, you mortally wound both the song and its performance. If the song happens to have brilliant lyrics, the audience will never know. The mix destroys the words.

Destroying the words means

- Destroying the *emotional power of the words*, which is half the appeal of a great song (assuming the lyrics are competently written)

- Destroying the *signature sound and style* of the act, since vocals usually define an act's signature sound and style

Why Sound Engineers Murder Vocals

Most acts that perform live have no clue about the central importance of the vocals. They assume the voice is just another instrument in the mix.

Big mistake.

Most live sound engineers assume that the band wants a LOUD mix of beats or rhythm instruments to convey a sense of POWER. Usually it's a male thing, a testosterone trip. More power! More power! My penis is bigger than your penis! LOUD beats or drums = POWER! (supposedly).

So, that's how they mix it. And that's how they routinely kill most or all of the lyrics to most or all of the songs.

Sometimes the act understands that vocals ought to trump drums or beats or guitars. But players fail to realize that the nice vocal-centric *monitor mix* they're getting on stage has nothing to do with the instrument-centric *house mix*, which is murdering the vocals.

How to Deal with Instrument-heavy Live Sound

In the house mix, reduce the levels of the rhythm instruments, especially drums or beats (the worst culprits) and rhythm guitars, so that everyone in the audience can hear the lyrics clearly all the time. Even the lyrics of the fastest, loudest songs.

If the house mix is already loud, and the vocalist's words are getting drowned out, don't turn up the vocals. If you do, you'll only make the whole mix louder. Instead, leave the vocal levels where they are and reduce the levels of the rhythm instruments in the house mix. Drastically, if necessary. Especially the drums.

Your objective is to ensure that, in any live performing situation, everybody in the audience can clearly hear at least 90% or more of the singer's or MC's words.

Never forget that the sound you are hearing on stage—your monitor mix—is *totally different* from the sound the audience hears—the house mix.

The house mix matters more than the monitor mix.

So you need your own sound person who knows how to do a vocal-dominant house mix.

Or, if that's not possible, you need someone out there during your performance to monitor the sound in the house and ride herd on the sound technicians if the lyrics aren't clear.

What If They Insist on Instrument-dominant Mixing?

If you address the ubiquitous problem of instrument-dominant mixing successfully, you will have a major advantage over practically all acts competing for audience and industry attention.

All you have to do is make it a firm policy of your act: intelligibility of the lyrics in the house mix takes precedence over supposed "power" of loud drums or beats or guitars.

Do not, under any circumstances, allow instrumental playing (especially drums) to drown out the house vocals in live performances. Not in heavy metal, not in punk, not in hip-hop, not in country-rock, not in any genre, not on any song that has vocals.

It's your vocals that primarily define your signature sound and style.

Stomp on the vocals, and you stomp on (and kill) your act's signature sound and style. And, of course, the meaning of the lyrics.

This applies especially if your act is in its formative stages, because you will make most of your money from gigging, not sales of recordings.

If non-vocalist members object to the supremacy-of-vocals policy and insist on prominent drums or beats or rhythm guitars in the house mix, try to persuade them of the importance of the audience hearing the lyrics. If they continue to insist on an instrument-heavy style of house mixing, fire them. Or quit the band.

If you keep performing in situations where lyrics routinely get destroyed in the mix, you deserve a lifetime of toil at Wal-Mart.

11.3.5 CONFIDENCE IS EVERYTHING: DEALING WITH PERFORMANCE ANXIETY/STAGE FRIGHT

As a performer, if you don't at least *appear* to be supremely confident (even if you aren't), all is lost. Your audience identifies with you. You and your music are symbols. If you lack confidence and it shows, they will desert you because nobody wants to identify with someone who lacks confidence. It's that simple.

Whatever you do, never admit you're nervous to an audience. You needn't cross the line to arrogance. That's an equal turn-off for audiences. Just keep in mind that they identify with you as the idealized, confident, talented person *they'd* like to be. They don't want to identify with a nervous wimp or an arrogant jerk.

Good musicians are thrill-seekers. But it stops being fun if fear overshadows the excitement and pleasure of performing. If you feel dread, you lose concentration.

Performance quality nosedives. When you lose confidence in yourself, the audience loses confidence in you.

If you're too nonchalant, just going through the motions, you'll bore your audience. If you get too aroused, too frightened, or too hyped up, your concentration will suffer, you'll lose confidence, and your performance will derail.

If you're confident, yet physiologically aroused and emotionally committed to the words and music, your performance will be first rate.

Performance anxiety is mainly about fear of making mistakes. This fear is misplaced because, in popular music,

- Audiences are seldom aware of performance mistakes
- Audiences are generally forgiving, even of the occasional obvious clunker

If you try to make your technical performance mechanically perfect, as an orchestral player does, of course you'll be anxious. Relax. It's popular music, not classical music.

A few antidotes to performance anxiety:

- Be so thoroughly rehearsed that the likelihood you'll forget even one word or note or chord change is low.
- *Expect* to make some mistakes. If you're performing original songs the audience has never heard before, they have no way of knowing whether you've made a mistake.
- Take a beta blocker.

What About Beta Blockers?

Beta blockers are prescription drugs that block the action of adrenaline. They're used primarily to treat heart conditions.

Since adrenaline enhances the process of memory-making, beta blockers have been used to induce amnesia when administered in conjunction with recall of a stressful event. So, for example, beta blockers may be useful in treating post-traumatic stress disorder.

Lots of public speakers and professional musicians do use beta blockers such as Inderal to cope with performance anxiety. And booze. And Valium. And other drugs.

A large proportion of musicians who play in major orchestras, fearing their nervousness will lead to mistakes (which they cannot afford to make, unlike in popular music) use beta blockers.

Beta blockers do work. They reduce performance anxiety. Inderal, for example, quells physical tremor due to nervousness without affecting cognitive functioning. (Beta blockers are not sedatives.)

Beta blockers are potent drugs that were not developed to reduce performance anxiety in musicians. However, if used in low dosages, they do the job without harmful side effects.

One disadvantage is that, while your performance may be technically correct, it loses intensity when you're on a beta blocker.

11.3.6 YOUR AUDIENCE OF ONE

> Your whole duty as a writer is to please and satisfy yourself, and the true writer always plays to an audience of one. Start sniffing the air or glancing at the Trend Machine, and you are as good as dead, although you may make a nice living.
>
> —STRUNK AND WHITE

Though you may play for an audience of 5,000, those are 5,000 *individual, private minds,* not a single "audience mind" consisting of 5,000 minds. So you really are writing and performing for one single solitary individual. First yourself, then one listener. And that's all.

If you write or perform for a demographic, such as 18- to 25-year-old African American males, or 30 to 45-year-old white females, you will sound phony. Or boring. Or both.

VERDI'S MUSICAL MONEY-BACK GUARANTEE

'Twas the year of 1872 in the city of Parma, Italy, and Verdi's *Aida* was having a successful run.

One day, Verdi received a letter from a disgruntled customer, a young man who had travelled some distance to Parma to see the opera. He saw it twice, just to make sure he didn't like it. Now he was requesting a refund, not only for the opera tickets, but also for his train fare *and* his meals.

Maestro Verdi, class act that he was, agreed to the request. He refunded the customer, including his train fare, but not his meals. But the dissatisfied customer had to promise in writing never to attend another new Verdi opera.

Source: Anne Lawson's Opera Resource
www.R-DS.com/Opera/Resource.htm

(Verdi was co-recipient with Hugo Wolf of the first Moose Nobel Prize in Music in 1901—see Appendix 3. Verdi returns to Sweden every year in the form of a moose.)

11.4 Performing in the Studio

11.4.1 Why Your Recorded Voice Sounds Different from the Way *You* Hear Your Voice

Recorders do not lie. Your recorded voice sounds different from the way *you* hear your voice because the sound of your voice reaches your brain in two ways:

1. Like any musical instrument, your voice causes molecules of air to vibrate and form percussion waves that reflect off nearby objects and reach your outer ear, then your inner ear, then your brain.

2. Your vocal sound also gets conducted through your neck and skull directly to your inner ear.

So the sound you hear when you speak or sing is always bigger and richer than a recording of your voice. Your recorded voice will always sound thinner and less substantive than the way you hear your own voice. Recorders can never capture the sound that travels directly from your larynx and resonating body parts to your inner ear.

One way to counter this effect is to develop your chest voice to the fullest possible extent. While your recorded voice still won't sound as rich as the voice you hear yourself, it will sound much better than if your chest voice is undeveloped.

11.4.2 CAMERAS AND RECORDERS DON'T LIE: VIDEO YOUR REHEARSALS

It's a simple matter to set up a video camera, a couple of microphones and a recorder. If you video your rehearsals, you will prevent yourself from becoming delusional about the quality of your performance. (If only *Idol* contestants would do this—but then the *Idol* audience would miss out on the entertainment value of watching delusional singers.)

Video cameras and sound recorders don't lie. Pay attention to the playback. That's exactly how an audience will see and hear you. If you look like an idiot and sound feeble, that's how others will perceive you. So do something about it.

If you think your voice sounds thin and unsubstantial because the recording gear is inadequate, think again. That's how you *actually sound* to others. Even cheap recording gear captures sound comparatively accurately. The voice you hear on playback *is* your sound and style. If you don't like it, you can change it.

Recording your rehearsals will provide you with the feedback you need to improve your act. Once you're completely satisfied with what you see and hear on playback, you'll have a lot more confidence when performing live, because you'll know in your mind what you look and sound like to the audience.

11.4.3 RECORDED VOCALS MATTER FAR MORE THAN INSTRUMENTAL TRACKS

First and foremost, don't record inferior original material. If you've written a bunch of songs before you started studying effective musical and lyrical composition technique, set those songs aside. They probably don't come close to what you're capable of writing.

Learn technique and spend some time writing great tunes with great lyrics.

When it comes to recording, adopt the same attitude as in live performance: give your vocals top priority. That doesn't mean you have to do 87 vocal takes of every song. It's not *technical* perfection of a vocal take that matters. People would rather hear ragged honesty in a vocal than technical perfection.

Vocal priority means a couple of things:

- Enunciation matters. If your consonants aren't clear, people will have a hard time understanding what you're saying. The last thing you need is to require

listeners to go looking for a lyric sheet if they want to know what you're singing.

- In the mix, ensure that, even on a tiny, cheap mono speaker system, the words are clear.

> ***Listen to George Martin's mixes of Beatles recordings. You can always hear the lyrics clearly.***

11.4.4 AVOID LAYERS OF OVERDUBS AND EFFECTS: PLAY IT LIVE AND SERVE THE SONG

> See, when I started to record, they just turned the microphones on and you recorded ... Whatever you got on one side of the glass was what came in on the controls on the other side of the glass ... What you did out front was what you got on the tape.
>
> —BOB DYLAN

If you have strong material, there's no reason under the sun why you need to spend any more than a week or two, or a few weeks at the most, recording a 10-song CD. Some bands waste months and months, and hundreds of thousands of dollars, recording one album. Which is okay if the label is fronting the money and insists on slick production.

The quality of a song probably varies inversely with the time required to record it to anybody's satisfaction.

If you're well rehearsed, you can record a CD live off the floor in one session, then add a few overdubs here and there to spice it up.

A good strategy is to use only a few instruments on each track, but a *different combination* of instruments on each track, representing, over the whole album, all the major families of instruments: brass, woodwinds, strings, percussion. That way, you get unity mainly from your vocal sound and variety mainly from the range of instrumental sounds.

Part IV

Making a Living in Music

12

How the Music Business and Music Entrepreneurship REALLY Work

You know, I'd go back there tomorrow but for the work I've taken on
Stoking the star-maker machinery behind the popular song
—JONI MITCHELL ("Free Man In Paris")

We're only in it for the money.
—FRANK ZAPPA AND THE MOTHERS OF INVENTION (album title)

12.1 Starters

12.1.1 SECTORS OF THE MUSIC BUSINESS

Before you read this chapter ...

- Do you aspire to earn a living as a performer and recording artist, but are currently working outside of the music industry (or are in school, college, or university)?

- Do you already earn a living in the music industry but would like to become a performer and recording artist instead of whatever it is you're doing, such as teaching music, working in a music store, working as a session player, etc.?

If you answered "no" to either of the above, this chapter probably won't interest you much. If "yes," you may find this chapter helpful.

The music industry is comprised of at least five major sectors or areas of activity:

1. ***Performing***—booking, promoting, and playing shows

2. ***Recording***—producing, distributing, and selling singles, CDs, videos, etc.

3. ***Copyright administration***—seeing that songwriters get financially compensated

4. ***Instruments and gear***—making and selling guitars, keyboards, amps, recording hardware and software, etc.

5. ***Education and training***—writing music education books, creating digital educational materials, teaching music-related courses, etc.

As well, the music industry has close ties with other sectors, especially:

1. ***Media***—radio, Internet media, print media, TV, film, advertising

2. ***Merchandising***—manufacture and sale of T-shirts, key chains, coasters, decals, hats, photographs, etc.

3. ***Dance***—everything from ballet and modern dance to disco and rave culture

4. ***Consumer audio equipment***—iPods, home stereos, etc.

Songwriting by itself is not a "music industry sector." Until you're in a position to *sell* your songs in some way—by performing them at the local pub for money, or by recording and selling a CD, or by having another artist perform or record your songs, generating income for you—until you've *monetized* your songs, your songwriting activity constitutes a hobby or pastime. It does not become "industry" until someone, in some way, pays you for your songs.

If you want to make a living as a songwriter-performer, you'll need to learn quite a bit about most of the sectors listed above.

12.1.2 To Reiterate: The Song Is the Currency of the Music Business

As discussed briefly in Chapter 11, the song is the currency of the music business. The beauty is that you have the right to print as much of your own currency as you please, and ***you have control over the value of your currency.*** That is, if you care to devote the time and effort necessary to become skilled at composing music and lyrics, you can create and trade in valuable currency.

Audiences crave valuable currency—Lennon-McCartney currency, Eminem currency, Bjork currency, Loreena McKennitt currency.

If you don't care to put in the time and effort it takes to become a skilled songwriter, then you will write mediocre songs, and few people will want to trade in your currency, no matter how much of it you crank out.

Fortunately, there's a market for every style and genre of popular music, providing the value of the currency is high. If you make the effort to create your own high-value currency, you can make a nice living trading in it.

If you decide that songwriting is not for you, but you'd like to earn a living as a singer, then the first thing you need to concern yourself with is the quality of the songs you select for your repertoire. One big mistake a lot of young singers make is selecting songs based on "hit" status. Whether or not a song becomes a *Billbaord* hit has nothing to do with song quality.

12.1.3
KILL UGLY ATTITUDE

You hear a lot about "attitude" in the music business. To have an "attitude" means to have an arrogant or antagonistic disposition. Nothing's more insufferable than a pop musician with an attitude. A jerk.

If you want to get into the business, try to be nice to people. Including people in the media. The music business is a relationship business. Most of those working in it—not all, but most—are in the business because they love music. And most are amiable folks. So don't whine and bitch about the music industry. Few people in the industry get to make a full-time living writing songs and performing them. If you get to that level, consider yourself fortunate and privileged. A band or songwriter-performer enjoys the limelight because a lot of people work behind the scenes in low-paid anonymity to make it happen. Appreciate them.

Don't do stupid, egocentric things such as two-hour sound checks in small clubs. If you swagger around with an attitude, pissing people off all the time, word will get around that you're an asshole. If you have a combative personality and strong opinions about the music industry, and you just can't help expressing them, find employment in another industry, such as the army. As the old saying goes, you meet the same people going up as you do coming down.

If you get signed to a label, don't adopt a know-it-all attitude and tell them how to do their jobs. If your songwriting currency is mediocre, be grateful they actually signed you. If your currency is valuable, everybody will know it. You will be able to do pretty much anything you want creatively; they won't drop you.

If you have a team of people around you, get rid of anyone with an obnoxious attitude, even if that person is your manager. You have to control your own career. Your manager works for you, not the other way around.

If you can't get into the music industry because nobody's buying into your original music, don't blame the vile music industry. Odds are, your songs suck and you don't realize it or refuse to believe it.

12.1.4
READ, READ, READ, STUDY, STUDY, STUDY

Before you decide to get into the music industry, read a lot of good books about it. Immerse yourself, as though you're studying to be a doctor or a lawyer. You will need that level of knowledge and dedication.

Also, ignore all the gossip, hearsay, rumor, and opinion that circulates all the time in the music business. Instead, pay attention only to facts, the evidence that you can verify, or advice that you know comes from a credible source.

What you want to do is get off on the right foot, avoid making preventable mistakes and blunders that cost you time and money and friends, and flag you as a rank amateur. You will make mistakes, of course, but you can minimize them by educating yourself.

Here's a list of books to consider (check the References section for details). The first book you need to study in depth is Donald Passman's. Many of these books are updated every so often, such as Bessler and Krasilovsky, so get the latest edition:

Avalon, M. *Confessions of a record producer*
Baker, B. *Guerrilla music marketing handbook*
Belleville, N. *Booking, promoting and marketing your music*
Bessler, I. (Ed.) *Songwriter's market*
Freeman, B. *Buzz your mp3*
Galper, H. *The touring musician*
Goldstein, J. *How to be your own booking agent and save thousands of dollars*
Hedtke, J. V., & Bradley, S. *MP3 for musicians*
Hooper, D., & Kennedy, L. *How I make $100,000 a year in the music business*
Kalmar, V. *Label launch*
Kohn, A., & Kohn, B. *Kohn on music licensing*
Krasilovsky, W., Schmel, S., & Gross, J. M. *This business of music*
Lathrop, T. *This business of music marketing & promotion*
Levine, M. *Guerrilla pr wired*
Passman, D. S. *All you need to know about the music business*
Schulenberg, R. *Legal aspects of the music industry*
Schwartz, D. D. *Start & run your own record label*
Spellman, P. *The self-promoting musician*
Stim, R. *Music law*
Sweeney, T. *Tim Sweeney's guide to releasing independent records*
Wimble, D. (Ed.). *The indie Bible*

Keep an eye out for new music business books in music stores and online retailers such as Amazon, Chapters, and Barnes & Noble.

PSYCHOPATHS, HUMAN AND CORPORATE: ANYBODY YOU KNOW?

A psychopath (also called a sociopath) is a person without a conscience. According to the eminent criminal psychologist and expert on psychopathy, Robert D. Hare, psychopaths are:

- ***Irresponsible***—they don't think twice about putting others at risk, and refuse to accept responsibility for the negative consequences of their actions

- ***Manipulative***—they use others to achieve selfish ends, while attempting to mask or hide their manipulative behaviour
- ***Grandiose***—they see themselves as far greater and more important than other people
- ***Lacking empathy***—they are unable to feel remorse about the harm they cause others
- ***Asocial***—they are hostile to, or unconcerned about, the welfare of others
- ***Superficial***—they easily adopt a facade of compassion and concern to make themselves look good

Sound like anybody you know?

On average, some 20% of prison inmates are psychopaths. In society at large, psychopaths make up at least 1% of the population, and possibly up to 4%. That's anywhere from *3 to 12 million North Americans*. Since only a few hundred thousand of them are in jail, that means ***more than 90% of psychopaths are walking around freely in society,*** wrecking people's lives. Which means you probably personally know a number of them. Robert Hare:

> *Psychopaths are often witty and articulate. They can be amusing and entertaining conversationalists, ready with a quick and clever comeback, and can tell unlikely but convincing stories that cast themselves in a good light. They can be very effective in presenting themselves well and are often very likable and charming. To some people, however, they seem too slick and smooth, too obviously insincere and superficial. Astute observers often get the impression that psychopaths are play-acting, mechanically "reading their lines."*

(Most psychopaths are male, by the way.)

It's likely that, on the business side, the music industry has more than it's share of psychopaths, and on the creative side, fewer. As Hare points out,

> *... many psychopaths are criminals, but many others remain out of prison, using their charm and chameleonlike abilities to cut a wide swath through society and leaving a wake of ruined lives behind them ... Psychopaths make up*

> *a significant proportion of ... unscrupulous businessspeople.*

In a study of 824 American business students, only 14% said they did not cheat. Marketing students had the highest cheating scores. Cheating has been empirically linked to subclinical psychopathy.

As you probably know, the music business is known for having a bit of a problem with "unscrupulous business people," such as personal and business managers who rip off their artist clients, lawyers with conflicts of interest, song sharks, and Internet scammers who sell sham promotional schemes to musicians.

That said, if, say, 5% of the business population of the music industry are psychopaths, 95% are normal people. All the same, it wouldn't hurt to keep in mind the complex of personality traits listed at the beginning of this sidebar when you're considering entering into a significant business relationship with someone whose actions will seriously affect your career.

If and when you find yourself being courted by a major label, consider this: every large corporation is, in effect, a psychopath. That's because a corporation is legally, a "person." It has more legal rights and freedoms than you have as a citizen. Yet, not being biologically human, a corporation has no conscience. So it behaves like a human without a conscience—a psychopath.

Joel Bakan, who studied the psychopathic activities of major corporations, explains how normal, non-psychopathic people behave like arms-length psychopaths when they act on behalf of large corporations:

> *The people who run corporations are, for the most part, good people, moral people ... Despite their personal qualities and ambitions, however, their duty as corporate executives is clear: they must always put their corporation's best interests first and not act out of concern for anyone or anything else (unless the expression of such concern can somehow be justified as advancing the corporation's own interests).*

A large corporation—essentially a corporate psychopath—is programmed to obsess about making money for itself (i.e., its shareholders). In fact, by law, it *must* put making money for its shareholders ahead of all other considerations, including ethical considerations.

For an interesting story of a major label's psychopathic behaviour, read Steve Albini's now classic article, "The Problem with Music," first published in 1993, but still relevant:

www.TheBaffler.com/AlbiniExcerpt.html

On a lighter psychopathic note, if you aren't familiar with it, the comic strip *Dilbert*, by Scott Adams, brilliantly satirizes corporate behaviour. At least three major characters, the Boss, Dogbert, and Catbert, are psychopaths. Get your daily Dilbert fix at:

www.Dilbert.com

12.1.5 THE MUSIC BUSINESS: A MALE BASTION

Once upon a time in the not-too-distant past, those responsible for hiring symphony orchestra players never hired women except as harpists. The men who did the hiring claimed men were better players. Eventually, in response to charges of discrimination, physical screens were introduced at auditions. The hiring committee could hear a candidate play, but could not see him or her.

Lo and behold, suddenly, women started passing auditions and getting hired for all positions in symphony orchestras.

This was a classic case of the naturalistic fallacy: hiring committees made the false assumption that, because many more men than women become career musicians, men are the natural musicians of the species, and the better players (see Section 1.5.14).

A symphony orchestra, like a rock band or a hip-hop crew or a folk duo, is a *business*. The music industry, especially at the "big business" level, is a male bastion: men structure it and run it to accommodate male competitiveness and male power- and status-seeking.

In a competitive business environment, according to research findings published in the *Harvard Business Review*, woman are far less likely than men to simply ask for their due For example, when offered a job at a particular salary, most men try to negotiate for more, while most women settle for the salary offered. The study found that women tend to regard such negotiations as counterproductive to good working relationships, whereas men thrive on the prospect of a good competitive game.

For the sake of having a business career at all, many women decide to delay the fulfilment of their natural desire to raise children. The time, money, and energy required for child-rearing is so burdensome for women (but not for men) that having a child can destroy the business career aspirations of any woman who does not have

lots of support and resources. This applies especially to women trying to get established in the child-unfriendly music industry, a playground for extended male adolescence.

In most industries, including the music industry, women have much more success at the small-business level. When you own your own business, you're in control. If you're a female songwriter-performer and you want to get into the music business on your own terms, your best option may well be to start your own small business: set up your own label. More on this in Section 12.3.

12.2 Your Public Image

My reputation is a media creation.
—JOHNNY ROTTEN

12.2.1 IMAGE, REPUTATION, AND ALL THAT

Mr. Rotten is dead on with respect to public image and reputation, whether you're a solo performer or in a band.

The first thing you need to keep in mind is that every single little thing the media learns and reports about your music and you personally, *whether true or false*, becomes part of your public image and reputation—the media creation of you. And every detail will be stored forever somewhere on the Internet, easily Googleable.

If you choose a career as an independent artist, you have much more control over your public image and reputation than you do if you sign with a label—unless your songwriting currency is extraordinarily valuable. If that's the case, you will have considerably more control over your public image and reputation, despite being on a label.

Your Musical Image and Reputation

- ***Story content of your lyrics.*** Audiences and critics associate the stories and scenes in lyrics with the lives of the singers of those lyrics, like it or not. Whatever your lyrics say—even if you did not write the lyrics—becomes part of your public image. More so if audiences and critics know you wrote the lyrics.

- ***Artistry of your lyrics.*** Apart from lyrical story lines, the artistry evident in lyrics becomes part of your public image. If you write and perform banal "wickerwork" lyrics (such as Generic Artless Relationship Lyrics), your public image and reputation will reflect that. You, personally, will be regarded as ordinary, lacking imagination—even if you happen to be a smart, fascinating, imaginative person. On the other hand, if you write imaginative lyrics, you yourself will be regarded as magical, as a person somehow capable of creating lyrical magic—unlike ordinary people.

- ***Your performing sound and style.*** If it's plainly derivative or clearly mimics an established artist, your public reputation and image will be much diminished, compared to what it would be if you sounded like nobody else and performed like nobody else.

- ***Video and film of your performing sound and style.*** Video and film will not hurt your public image and reputation, and may enhance it. But a creative video (as opposed to simple concert footage) will always destroy the images your lyrics create in listeners' minds. Unless your record company insists on having you do a creative video, stick with straightforward concert video and film, or television/Internet appearances in which you simply perform. If you write mediocre lyrics, creative music videos may enhance your image.

Your Persona

> Most rock journalism is people who can't write interviewing people who can't talk for people who can't read.
>
> —FRANK ZAPPA

- ***Your persona in a radio or television interview***. Oh dear. People who can't talk. That's the case with most musicians. A few have natural wit, and fare better. If you already have a public image and reputation as a mediocre lyricist, go ahead and do all the radio and television interviews you want. Nothing you could say could further diminish your public image and reputation. If you're only getting started and have no public image at all, do as much radio and television as you can, just to get on the map. However, if you have a reputation as an outstanding lyricist but you're not terribly witty or adept at extemporaneous wordplay, you will damage your public image by granting radio or television interviews. Nothing you could say in spontaneous answers to an interviewer's questions could match the brilliance of your song lyrics, which took you a great amount of time and effort to create. So don't do radio or television interviews.

- ***Your persona in a radio or television interview combined with live performance or airplay***. A situation that combines interviewing with performing presents a problem. If you're just starting, again, do anything and everything that comes along. If you have a reputation as a great songwriter-performer, it's to your advantage to perform, but to your disadvantage to talk. If the format of a radio or television program is such that performers answer an interviewer's questions, interspersed with live or recorded performances, then talk as little as possible in the interview segments. One word answers. Long pauses between answers. Outwait them. Interviewers loathe dead air and will fill it up themselves. They can't force you to run off at the mouth. So don't. Say little. Maybe they'll give up and let you play more music (or play more of your recordings).

- ***Your persona in a print interview (paper or Internet)***. You will fare better in print because the reader does not get to see video of you or hear you speak. The reader must use his or her imagination to conjure up an image of you, a video in the mind. Also, an editor will usually tidy up verbatim responses so that the story doesn't read too much like a person who can't write has interviewed a person who can't talk. It's better for your image and reputation if a reporter interviews you and writes a story containing a few quotes, as opposed to simply recording the interview and printing the transcript. If you're the subject of a newspaper or magazine *story*, imagination comes into play on the part of the reader.

  > ***The more people know you through imagination instead of reportage of mundane reality (such as verbatim interviews), the better.***

  One caveat: don't grant print interviews to minor print media players, such as local weekly community newspapers. Stick with major papers and music magazines. You are whom you associate with.

- ***Your visual persona.*** The greater your image and reputation as an artist, the less your visual appearance matters. *And vice-versa*. Since nearly all performing songwriters write and perform mediocre material, they understandably obsess over how they come across visually. If you become one of those rare performer-songwriters who has learned how to create brilliant, magical songs, your image will soar to even greater heights if you take the trouble to appear in public looking the part, instead of dressing like an ordinary slob. In your publicity photos, make sure you don't look ordinary. Don't even appear on the street looking like an ordinary slob. You never know who will recognize you.

- ***Your persona in a documentary***. As long as they don't interview you, you should be alright. They'll have to focus on something else, or report about you as a story. If you're important enough to be the subject of a documentary, and the documentary makers don't even have direct access to you by interview, your public image and reputation will go up.

- ***Your back story***. You can falsify a back story for the media if you want to. But it can backfire, as it did for the white rapper Vanilla Ice, who made up a back story in order to gain street credibility. It worked for a while until the media found out his story was a pack of lies. The image and reputation of the rapper Ol' Dirty Bastard might have suffered had the truth been widely reported, before he died, that he came from a comfortable, stable middle-class background, with loving parents—that he did not grow up dirt poor in horrible circumstances in the projects, as was the story he fed to the media. (On the other hand, ODB's lyrics and crazed rap style were so unique, and his personal life was so colourful, that it seems unlikely his made-up back story would have hurt his image much.) Keep your media bio short and focus on interesting stuff—facts, not opinions. Seems like common sense, but, in bios and interviews, so many musicians go on and on about the silly trivia of their personal lives.

> ***As far as your public image is concerned, you are what the media reports you are. If you give the media silly trivia, your public persona will be that of a silly, trivial person.***

FANHEADS

If your act has a strong public image and a loyal fan following, perhaps one day your fans will start calling themselves "heads":

"Deadheads"	Fans of the Grateful Dead
"Phishheads"	Fans of Phish
"Parrotheads"	Fans of Jimmy Buffett
"Gearheads"	Fans of Bachman-Turner Overdrive (BTO)
"Fredheads"	Fans of Fred Eaglesmith
"Zedheads"	Non-American fans of Jay-Z (The last letter of the English alphabet is pronounced "zee" only in America. Everywhere else in the world, it's pronounced "zed.")

Fame vs Celebrity

As Bob Geldof pointed out at the beginning of Chapter 11, the desire for fame can be highly motivating with respect to a career in the music business.

- ***Fame:*** You become well-known for doing one thing. For example, you dive into a river and rescue somebody. Or you have one hit song and never come up with another one.

- ***Celebrity:*** You become famous and stay famous *over a sustained period of time*. Some people do not earn their celebrity, such as supermodels and members of the royal family. If you have a long, high-profile career in the music industry, either as a performer or as a songwriter-performer, you will become a celebrity —whether you're musically talented or not. If you write lots of songs that become well-known, but you don't perform them and few people know you wrote them, you will not become either famous or a celebrity. Few people in America know much about Bernie Taupin, lyricist on most of Elton John's great songs. But everybody knows Elton, the high-profile *performer* of those songs.

HORRIFIED OBSERVERS OF PEDESTRIAN ENTERTAINMENT (H.O.P.E.)

Speaking of unearned celebrity, a lot of people are up in arms about the mass-marketing of no-talents, such as:

- Lip-synching pop "singers" and rappers
- "Actors" and "actresses" who get plum TV and movie parts because they're from prominent families, or have had some hit records
- Television show hosts who get huge sums of money and celebrity perks, yet have no discernable talent other than the ability to read Teleprompter lines others have written for them

H.O.P.E. organizes campaigns that aim to stamp out this type of stupid, substandard entertainment. Yes, it amounts to tilting at windmills, but somebody's got to at least try. The organization is particularly incensed at Big Music, the major labels that use their deep pockets and marketing muscle to turn the likes of Britney and Diddy and the Simpson sisters into major stars.

For more on how to help sabotage the escapades of the entertainment industry's rich and brainless, visit H.O.P.E.'s online command centre:

www.HopeInAmerica.com

12.2.2 HOW TO CREATE A STAGE NAME

If you don't already have a public image and reputation as a songwriter-performer, or it doesn't extend very far geographically, create a high-EPA stage name. (Your real name is probably low-EPA and mundane.)

To create a high-EPA name, use the 120 high-EPA words on the seed list you created in Chapter 10. Start working through two-word combinations. You won't find it difficult to create an excellent stage name if you stick with simple high-EPA words.

Your stage name should have these characteristics:

- Two words; use three words only if all three are short and high-EPA
- A name that works as the name of a single individual, not a band
- Easy-to-understand words
- Easy-to-spell words
- Unambiguous spelling (e.g., avoid "Sea" if it could be confused with "See")
- No hyphenation
- No made-up words (a word that does not already exist in the brains of most people has zero-EPA value and may have ambiguous spelling)

This is extremely important: ***Your stage name must be available as a dot-com.*** It will become the address of your official website. Only dot-com matters, not dot-net or dot-anything-else. Not even .co.uk or .com.au. or .eu. *Just plain .com.*

An easy place to check domains is www.CheckDomain.com

NOTE: It's not true that all the best two-word dot-coms have been taken. There are *countless billions* of two-word dot-com combinations available. (Recall from Section 1.3.13 that language is combinatorial.)

One strategy you may find effective is to combine one high-EPA word from the language with a proper-noun first name (most proper nouns are high-EPA), such as "Midnight Carlos" or "Stray Jane." As of this printing of *How Music REALLY Works!*, *midnightcarlos.com* and *strayjane.com* were both available. So was *janecarlos.com*. (So was *deputyfester.com.*)

The point is, you won't run out of excellent high-EPA possibilities if you follow the above guidelines. Make up a list of half a dozen or a dozen candidate names and check out which ones are available as dot-coms.

Do some Internet searching and cross off any name on your short list that any other musician has ever used.

Make sure none of your candidate names are registered trademarks. There are several free trademark search engines on the Internet, such as the one at www.uspto.gov. Once you start using your stage name, it will, in effect, become your trademark. When you get some serious money, you may want to legally register your stage name as a trademark.

If you're satisfied that no other musician has used any of the names remaining on your short list, and none are registered as trademarks, register the top three or four of them as dot-coms for one year each. It's not expensive, and you may need a fall-back name if it turns out there's a problem with your first pick and you have to change it fast.

10 OTHER WAYS TO GET A STAGE NAME

The Internet has a number of scintillating music-related name generators. Here are 10, to help you fritter away some of the precious, irretrievable hours of your one and only life:

Rock Star Names:
http://RockStarName.com/index.php

Rap Star Names:
http://RapStarName.com/index.php

Country Star Names:
http://CountryStarName.com/index.php

Pop Star Names:
http://PopStarName.com/index.php

Reggae Names:
www.Irielion.com/Israel/ReggaeName.html

General Band Names:
www.BandNameMaker.com/d/index.html

Emo Band Names:
http://members.aol.com/Valdes379/EmoGame.html

Bluegrass Band Names:
www.MandolinCafe.com/Archives/Bandnames/

Glitter & Glam Rock Names:
www.angelfire.com/ny/MetalBabe/GlamName.html

Pagan Names:
www.Newmoon.uk.com/Wicca/Name.html

12.2.3 IT'S *YOUR* NAME AND CAREER THAT MATTER— NOT YOUR BAND'S NAME AND CAREER

Once you settle on a stage name, it's vital that the name always be associated with *you* personally, not with any band you may be in. It's *your* career that matters, not your band's career.

Being in a band enables you to create a bigger sound than you can create as a solo performer. Also, you get a sense of security, belonging, and camaraderie—provided you get along with your band mates.

However, it's one thing to front a band *named for yourself*, with the other players supporting you. It's another to be in a "democratic" band, a band with a name that has nothing to do with you, where you are just one of three or four or five band members. This situation is the norm, but it has a lot of serious disadvantages for you if you want to advance your career:

- As long as you're in a democratic band, the band's image and reputation get media attention, not *your* image and reputation. Unless your band makes a big breakthrough (extremely unlikely, however hopeful you may be), nobody outside of your circle of friends and local fans will know who *you* are. Your career will go nowhere.

- Often in a band, all members share songwriting credits—not good for you, for reasons discussed in Section 11.1.3.

- If your band tours club-level venues to support a new CD, the tour will usually lose money, unless your band's label provides tour support (which is recoupable). If you tour as a solo act under your own stage name and draw similar-sized crowds, you will not only increase your own media profile, but

you will likely make some money if you keep expenses down, sell CDs and merchandise at each show, etc. (Most independent artists make far more money selling CDs at shows than selling CDs at retail.)

- In a democratic band, you are not in charge, so you have no power to get rid of an obnoxious member in the event of a personality clash. You have to put up with the situation, or hope the other person quits the band, or quit the band yourself.

- Since you are not in charge, you have no control over important matters such as:

    - Division of labour, such as who looks after which aspects of the band's business, who maintains the band's website, etc.

    - Musical decisions, such as who chooses songs for shows and recordings, whose songs get recorded, the circumstances of recording and release dates, etc.

    - Drug-taking among band members

- If the band splits up (*when* it splits up), you have to start from scratch, building a public image and reputation. Former fans of the band may regard you as a has-been. Others may have heard of the band but never have heard of you.

For all of these reasons, think long and hard before forming or joining a democratic band. Over the long term, your own career matters more than any band's career.

NIKKI M'S BAND NAME THEORY

Nikki M's "Geographical Band Name Postulate" goes like this: "All bands with a geographical location in their name, in a word, suck."

Here's the evidence, according to Nikki M, in alphabetical order:

America
Atlanta Rhythm Section
Bay City Rollers
Boston
Chicago
Frankie Goes to Hollywood

Georgia Satellites
Manhattan Transfer
Rick Springfield
Tony Orlando and Dawn

You can diligently study Nikki M's complete theory and damning research findings here:

www.PopCultureMadness.com/Music/WORST-Nikki.html

12.2.4
YOUR OWN PERSONAL DRUG PROBLEM

Cocaine is God's way of saying you're making too much money.
—ROBIN WILLIAMS

Since antiquity, humans have used alcohol in association with both music listening and music making. Today, professional popular musicians are immersed in alcohol-consuming culture, since almost all music venues serve alcohol. A large proportion of venues earn most of their income from alcohol sales.

In live music venues, you can purchase a cornucopia of illegal psychoactive drugs for hedonic use. As discussed in Section 9.1.3, an intense musical experience causes the release of opioids in the brain. So does taking certain drugs. When you're not in a situation where you can experience music, you can get a similar feeling by taking drugs. And, of course, if you take drugs while experiencing music (playing or listening), you can have an even more intense experience.

The more intensely pleasurable the feeling, the greater the drop when the effect wears off. Also, of course, some drugs fry bits of the brain, alas.

Hmmm.

This leaves you with your own personal drug problem: you have to decide what you're going to do about personal hedonic drug-taking, with so much drug availability and so many musicians around you indulging.

Apart from considerations of mental, physical, and social health (i.e., the consequences of your behaviour on those close to you), drug-taking has career implications:

- If you expect to succeed as a music business entrepreneur, you're going to have to work long hours and use of all of your mental faculties. When you're on drugs, you take yourself out of the game.

- Dependency on illegal psychoactive drugs or prodigious quantities of alcohol can cost a lot of money, funds you will not be able to use for career development.

- If you develop a reputation as a druggie or alcoholic, you will have problems attracting good people to work with you and for you.

- If you develop a reputation as a druggie or alcoholic, you may never get offered opportunities to partner with record labels and gain wide exposure for your music.

- If you get busted for drug use or drug dealing, all sorts of nasty consequences could ensue:

    - Crippling legal expenses

    - Possible incarceration

    - A criminal record, which may have negative implications with respect to touring internationally, among other things

    - Damage to your reputation that could affect business relationships

Nobody's going to force you to knock back a case of beer or roll a fistful of weed every day. And nobody's going to force you to be totally abstinent, either. You have to decide in your own mind where you're going to draw the line, not only for yourself, but for other people you may eventually hire to work with you.

12.3 Your Own Label

12.3.1 10 Reasons to Do It Yourself

> Before I got into rock 'n' roll, I was going to be a dentist.
>
> —GREGG ALLMAN

In this age of Internet media, website-based music distribution, webcasting, satellite radio, podcasting, and other such technologies, becoming successful as a musician-entrepreneur isn't as hard as it used to be *if you have high-value song currency.* If you don't—that's another story.

Here are ten reasons to set up your own label instead of chasing a deal with a large indie or major label.

1. Control

When you own your own label, you control:

- What songs you record
- When you record
- What songs you perform live
- When you perform live
- Your public image and persona
- How and where you run your business
- How you use the revenue your business generates
- In short, *everything*.

When you run your own label, you have to be a control freak to a considerable degree. The more things you learn to do yourself, the less you'll have to spend on outside help. For example, you can learn basic web design skills and build your own website. Later, when you have more money, you can hire a pro to re-do it, or do a make-over. You need not, and should not, put off having a web presence.

A MODEST BUT IMPORTANT VISUAL DESIGN EDUCATION

Knowing something about visual design has lots of applications for an indie label owner:

- Designing your website
- Designing media materials such as media kits, posters, etc.
- Designing CD covers and packaging
- Designing and creating images for consumer merchandise such as T-shirts, decals, beverage coasters, etc.

Even if you have the money to outsource such tasks instead of doing them yourself, you'll need to be able to tell the difference between good, effective design, and poor, ineffective design that looks "professional." A basic understanding of visual design

will influence your contracting decisions and your approval or disapproval of all the visual aspects of your products and image.

The *Non-designer's Design Book* by Robin Williams (not to be confused with the comedian) will provide you with a good grounding in the basics of visual design. Look up Ms Williams in the References.

2. Freedom of Association

When you sign with a label, you become their contracted employee and you have to work with whomever they say, such as record producers, marketing personnel, and so on—whether you get along with them or not.

The label may even decide to replace members of your band, over your objections.

If you're an independent artist with complete control over your career, you decide whom you work with.

3. Speed

You can record your music and get it out there much faster than a record label can. Moreover, a record company has complete control over the timing of a single or CD release. They may decide to sit on it for 6 or 12 months before releasing it. If you want to, you can record a set of 10 original songs live in your home studio in one afternoon, make it available as a $9.95 download, and start promoting it the next day. If the songs are genuinely brilliant, and your sound and style are unique, nobody's going to care how long it took to record it, or where it was recorded, as long as the sound quality is industry standard.

4. Profit

As an independent artist, you will be able to sustain a career with CD sales in the thousands or tens of thousands annually, not in the hundreds of thousands or millions.

Here are a few ways you, as an independent artist, can make money—ways that are not available to label artists:

- You can use your website to sell your CDs at full retail and keep most of the money (minus an order fulfilment company's fees).

- You can use your website to sell downloads of your live shows. Think of it this way: every time you perform, you create enough content to fill a CD. Even if you perform the same songs, each *performance* is different. The song order is different, the audience response is different, the sound of the room is different. You can digitally record simple stereo mixes of your live shows, pick the best ones, and make them available as MP3 files on your website for, say, $9.95 per concert. If you've learned effective songwriting techniques, you should be able to write at least 10 great new songs every six months or so. New content all the time. (Your fans, being humans, are neophiliacs!)

- If you're ambitious you can burn CDs or DVDs of some gigs and sell the recordings to fans immediately after the show. Make sure they know, as they go into the venue, that the CD or DVD of the performance will be available immediately after the show. (Also, make sure the quality is good. Take a live stereo mix from the board directly to your computer. And obviously you'll need fast-duplication equipment.) If they like your music, and your people make the CD available to fans right then and there at the show for say, $20, a healthy percentage of those fans will buy. They get something special: a one-of-a-kind CD of a show they just saw and enjoyed, a CD they won't be able to get anywhere else. If they can't stick around to wait for the CD, your people can always get their money (always get paid!) and send them the CD the next day.

- A company such as www.ArtistShare.com will sell your music in more forms than just CDs, and turn over most of the money to you. If you don't sign with ArtistShare, you can get a lot of income-generating ideas from their model.

- You can get your music heard and sold through sites such as (among others) www.CDBaby.com, www.MP3.com, and www.ProjectOpus.com.

As well, as an independent artist, you can earn a considerable profit from merchandise sold on your website and at your shows.

5. Simplicity

Although it's a lot of work, running your own business is not that difficult, and not that complicated. When you're starting out, your business has only one employee and few assets: your bedroom studio, a computer or two, some musical instruments, some software and books, etc. If you use a bookkeeping program such as Intuit's *Quickbooks*, you can do your own business record-keeping pretty easily.

6. Guarantee of Getting Signed

Hardly anybody who sends a demo to a large indie or major label gets signed. A large proportion of artists who do get signed are dropped within a few years.

If you decide to spend a lot of time and effort upgrading your songwriting skills, you will probably be able to get a label deal. If you decide not to upgrade your songwriting skills, you will have a much, much harder time getting a deal because you will be competing with countless thousands of other acts who also have minimal songwriting skills.

When you own your own label, you sign yourself, regardless of your songwriting skill level. You can release as many CDs as you feel like releasing, and your CDs will never go out of print if you don't want them to.

7. A Music Business Education

What better way to learn the music business than to run your own label? Of course you'll need a day job while you learn the business. But the more things you learn to do for yourself, the better you'll know the industry. The easier it'll be to get paid for doing music, and eventually to quit your day job.

8. Self Confidence

If you can set up and run your own label *and make a profit* (that's the key), you will gain enormous self-confidence. It will show not only in your business dealings but in all aspects of your life, including your performing and writing.

9. Career Longevity

As long as you're running the label, you won't drop yourself from the label. You can start your career whenever you want and stay in the business for as long as you want. You can record as many or as few CDs as you want. You can tour on your own schedule.

Incidentally, there's no such thing as being too old to be a songwriter-performer. You could start your career at the age of 17 or at the age of 70. It doesn't matter. If your songs are brilliant and you have a signature sound and style, people will buy your music. Age is no barrier when you're an independent music entrepreneur.

If you're not in your teens or twenties, major record labels usually won't even consider you, unless you're already on another label and looking to switch.

10. Integrity

For the sake of publicity or marketing, a major label insists that its artists do some things some artists would rather not do. The label also prohibits artists from doing some things they'd like to do.

As your own label's artist, you alone make all such decisions.

12.3.2 BUILD YOUR OWN STUDIO; LEARN RECORDING AND MIXING

In the olden days, you had to book a studio to record a decent-sounding CD. Now you can record it at home for a fraction of the cost and get the same quality—*if you know what you're doing.* You may have to book a studio to do the mixing, but that's about it.

You may already have a home studio. If not, it's not expensive to set up. Study some books on home recording.

A couple of things to keep in mind:

- If the song quality is brilliant, you don't need to make elaborate recordings with slick production values. *And vice-versa.* The reason you hear elaborate recordings on commercial radio is that, when you strip away the layers of production, the songs are lame.

- As long as a song is cleanly recorded and well-mixed, who's going to know it was recorded in your bedroom with a few microphones, a computer, and some software? If somebody wants to buy your CD because they heard a couple of tracks on a satellite radio station somewhere, *that person doesn't know or care whether your CD was recorded at Abbey Road or in your home studio*, as long as it has those tracks and the recording quality is good.

12.3.3 ARE YOU READY TO TOUR? DO YOU HAVE MANAGEMENT? AN AGENT?

First things first...

- Study musical and lyrical technique inside out and backwards

- Create a signature sound and style
- Write at least 30 original songs (all of them *after* you learn effective technique)
- Study the music industry thoroughly and set up your own label
- Create your own recording studio
- Learn to engineer and produce
- Record at least two CDs of at least 10 original songs each (preferably three CDs); keep writing steadily (two or three new songs a month)
- Set up your own good-looking eponymous website, with a great press kit, a few free MP3 tracks from your CDs, one-minute clips of the other tracks, and an easy method by which people can purchase your CDs and merchandise
- Put together an excellent set
- Book some shows
- Build up a lot of media buzz (offline and online) about your songs and your sound, on the strength of your CDs and downloadable tracks on your website

Total time required to do the work you need to do before you're ready to start playing original material for paying audiences: at least *five years.*

If you think you can do it all in, say, a year, you're delusional. It will take you at least a year or two just to upgrade your composition skills, never mind the time required to create a unique performing sound and style (perhaps a year), compose 20 or 30 great songs (another year), put together a studio, learn basic engineering and producing (another year), educate yourself about the music business (another six months to a year), build a first-rate website and put together a media package (at least several months).

You'll be doing a lot of these things simultaneously, of course, but if you do it right, the total time will still probably exceed five years. About the time it takes to earn both an undergraduate degree and a master's degree at a reputable university.

One other thing: if you're holding down a full time job, it'll take quite a bit longer.

Not only that, when you're finally ready to step out, you probably won't even have a personal manager.

Nor a booking agent.

When you're starting out (having already recorded two or three full CDs of original songs), try to play at least two or three shows a month. You won't get into the big popular clubs right away. They have hundreds of bands competing for a

comparatively small number of slots per week, so they probably won't book you until you get some experience, have a sizable fan base, and have a manager and an agent.

At first, you'll have to book your own shows. Start locally. There's nothing stopping you from renting rooms and halls and promoting your own shows.

The thing is, nobody's going to come to your shows unless they've heard your music. You probably won't get commercial radio airplay without being signed to a major label or large independent label.

But there are other ways to get your music to the ears of potential fans.

When a newspaper or magazine does a story on you, make sure they plug your website, where curious readers will be able to listen to some of your tracks.

> ***Your songs have to be so insanely great that music writers will rave about your songs. A sizeable proportion of people who read about you and visit your website will make a purchase of either a track or a CD upon hearing one or two of your songs*** **just once.** ***They will go straight to the tour info on your website and find out where you're playing next.***

If your songs are not on a par with the best songs ever written in popular music, you're going to have a hard time getting your career going. (There's a popular myth in the industry that, at any given time, there are thousands of bands and individual songwriter-performers all writing brilliant material, but not getting signed by major labels because the majors can only sign a few new acts a year. Not true. Practically nobody in those bands has any significant songwriting know-how. The lower the skill level, the more competition.)

Promote yourself to public radio, community radio, college radio, satellite radio, Internet radio, podcasts. Make your songs available in as many places on the Internet as possible—not just your own website.

Keep after the media all the time and keep records of every bit of coverage you get, be it print, broadcast, or online. Again, *if your songs really are astounding*, media people will rave about you. This will help you attract a reputable manager or management company and a booking agent. Once you have some delirious media coverage and some legitimate industry people working for you, it'll be easier for you to play more often, start making a bit of money, and move to the next level.

Once again, though, it all depends on how incredible your songs are.

12.3.4
FILE SHARING: YOUR BEST PROMOTIONAL TOOL

> I don't mind what Congress does, as long as they don't do it in the streets and frighten the horses.
>
> —VICTOR HUGO

"File sharing" means that some people illegally "share" (i.e., steal) other people's property. Here are some popular euphemisms for music file theft:

- Music file sharing
- Music file swapping
- Music file trading
- Music file downloading
- Free music downloading
- P2P habit
- Sampling music

And some popular rationalizations for music file theft:

- Metallica is already soooo rich!
- Record company owners make millions; why should I pay for that?
- I paid for the computer and the CD, why should I pay for the music?

Of course file sharing infringes copyright. Of course it's illegal. Outright dang theft, and all that. Fetch Marshal McDillon.

But, as an indie musician, consider what file sharing can do for your career. You, the indie musician, have no access to mainstream commercial radio. No flashy music videos. No major label hype machine behind you.

But you *do* have file sharing. "Free" *sells*.

File sharing *helps* independent acts, who make much of their money on touring and T-shirts. As an indie artist, embrace file sharing. It's your best promotional tool.

You have nothing to gain by complaining you're a victim of file-sharing piracy. That argument is long over, despite the major labels' insistence (through the Record Industry Association of America, or RIAA) on suing music fans—*their own customers.*

Consumers now lead the industry, not record labels. Some day, the industry will figure out a way to monetize illegal music file sharing, perhaps by collecting money from Internet service providers (who facilitate illegal music file sharing) and distributing it to songwriters and performers, the way radio stations pay performance rights fees that are distributed to songwriters via ASCAP, BMI, PRS, etc.

A rigorous study by researchers at Harvard University's business school found that file sharing has not been the cause of the decline in CD sales in America in recent years. CDs now have to complete with a much wider range of options for the consumer's entertainment dollar, such as electronic games and other computer-based amusement.

The Harvard researchers directly observed illegal file sharing activity and found that when sales of a CD declined, file sharing of that CD did not increase, as would be expected if there were a link between declining CD sales and file sharing.

If file sharing is linked to CD sales, the link is more likely *positive*. People file-share tracks, the artist gets more widely known, buzz about the artist increases, sales of the artist's CDs increase.

So, while the industry tries to get its act together, you can take advantage of the revolution. *Encourage* sharing of your MP3s.

If fans consider your music good enough to even bother file-sharing, legally or illegally, you're doing something right. They more they share files of your music, the more ***they're demonstrating that they like your music.*** Jump up and down for joy—you've got fans! Many of them will *buy your music* if you make it easily available with good sound quality and attractive packaging.

Why will they buy your music?

- Most people are not criminals and don't like to be thought of as criminals. Given the choice between stealing an artist's music and paying for it, most opt to pay for it. See, for example, Jane Siberry's "self-determined pricing" model at www.JaneSiberry.com.

- People who have experienced the down side of illegal file sharing—stealth viruses, spam to the nth degree, spyware, etc.—prefer to download from safe, legal sites. Otherwise, iTunes would have crashed and burned long ago, instead of exploding in popularity and prompting numerous other companies to open major legal downloading sites of their own.

If people are interested enough in your music to share files of your songs, they'll turn out for your shows, provided you let them know where you're playing and when, on your eponymously-named website.

Every time you record a CD, make some (not all) of the tracks available as free downloads on your website. You will find that sales of *all* of your CDs will go up.

A fan of yours will want your CD, with its better-than-shared-file sound, printed lyrics, colourful packaging, liner notes—that physical, collectable, *tangible* piece of you and your music. A fan feels a more satisfying connection with you by owning your CD than having your music exist only as an MP3 file on a hard drive or in an iPod.

Keep in mind that file sharing is *file* sharing only. It isn't theft of a CD package, or T-shirt, or poster, or ticket to your next performance. You have control over the sale of all those things. You can leverage file sharing to get your music more widely exposed, generating higher sales of all your other products (including your performances), which they can't download.

If you generate enough buzz around your music through file sharing, then podcasters, community radio, college radio, Internet radio, public radio, and satellite radio (especially satellite radio, whose subscribers want to hear new, unsigned acts) will take notice of you and your songs and start playing them. And if that happens, record labels may come knocking.

12.3.5
YOUR POWER OVER RECORD LABELS

The only power an artist has in deciding whether or not to sign a publishing or recording contract is the power to say *no*. And the power to say no comes from having a fan base and a good income. That's one of the best reasons for becoming self-sufficient as an independent artist before you consider signing with a label.

If you have your own record label and people are buying your CDs, record companies will take an interest in you. Saying no doesn't mean saying no to any possible deal. It means saying no to any deal that would not benefit you in the long run.

As well, if you decide to sign with a label and it doesn't work out in the long run, you can always revive your own label, write new songs, and continue with your career.

12.3.6
HOW TO HANDLE MUSIC INDUSTRY LAWYERS

Lawyers make money working on legal problems. Not necessarily *solving* legal problems. Just working on them. When you hire a lawyer, you pay through the nose, whether the lawyer solves your legal problem or not. *Especially if you go to court.*

Since a lawyer makes money working on problems whether he or she solves them or not, a lawyer has a vested interest in keeping the clock running as long as you have the money to retain him or her. (Again, especially if you go to court.)

As an independent artist setting up a business, you'll need legal help. You will need an experienced lawyer who *specializes in music industry legal matters*, not a lawyer in general practice. If you know of a respected bona-fide music industry lawyer whom you would like to hire, do not let the law firm steer you to some other junior lawyer or articling student.

As for the job you need done, focus on *results*. That's what you're hiring the lawyer for. To get a specific job done. Lawyer Nicholas Carroll, in his book, *Dancing with Lawyers,* advises that you adopt the following strictly-business attitude when dealing with a lawyer:

> I'm buying a service which provides the following results ... I need to know what results can be expected, how much it will cost and when it can be done ... Without this information I can't make a decision. If I can't make a decision, I'll have to let this job drop. (And then you [the lawyer] will not be hired.) If the value (to me) of the results is greater than the cost, *and* the cost is within my budget, I'll buy. If the value (to

me) of the results is less than the cost, *or* the cost exceeds my budget, I won't buy.

In other words, focus on the *job*, not the lawyer's personality. Let the lawyer know that you have a budget, and that if he or she cannot do the job and *get the results within the budget*, you will not hire that lawyer.

Do not tell the lawyer what your budget is, nor even hint at it, nor suggest how much you expect the job might cost. If you say, "I expect this job will cost me $2,000 in legal fees," and the lawyer knows he or she can hand it off to a secretary who can do the work in two hours, don't be surprised if you get a bill for, oh, $1,926.42.

You'll need legal work mainly for contracts and business advice. However, if you get into a legal dispute, try to settle out of court as quickly as possible. If you don't, legal costs will bankrupt you. Never mind notions of "justice." You probably won't get it—unless you have tons of cash and can afford to purchase the services of a highly skilled legal team that can get you off, even if you molest children or murder your spouse or ex-spouse. A court of law is a debating forum. The team that wins the debate (normally the highest-paid team), regardless of the evidence, gets "justice."

12.3.7
14 INDEPENDENT SONGWRITER-PERFORMERS AND BANDS WORTH STUDYING

Below is a list of 14 successful independent songwriter-performers and bands, and their websites. Half of these artists are men, half are women. They represent a variety of musical genres (rock, country, folk, jazz, undefinable alternative) and a range of entrepreneurial models.

If you're serious about getting into the business as an independent artist, study all of these songwriter-performers and bands closely (and any other successful independent artists you may know about). Most of these artists have had long careers and are still going strong,

Buy a track or two of their music and get a feel for their online sales systems. Look at the range of products they have for sale, including their back catalogues. Mostly, *study the way they market their music.*

Also, don't limit yourself to studying just their websites. Poke around on the Internet and see what else you can learn about them.

Jane Siberry	www.JaneSiberry.com
Ricky Skaggs	www.SkaggsFamilyRecords.com
Loreena McKennitt	www.QuinlanRoad.com
Sloan	www.SloanMusic.com/a/Murderecords
Paula Toledo	www.PaulaToledo.com
DOA	www.SuddenDeath.com

Ani DiFranco	www.RighteousBabe.com
Fred Eaglesmith	www.FredEaglesmith.com
Ferron	www.FerronOnline.com
Jandek	http://tisue.net/Jandek/
Andrea Florian	www.AndreaFlorian.com
They Might Be Giants	www.TheyMightBeGiants.com
Janis Ian	www.JanisIan.com
Jim Hall	www.JimHallMusic.com

12.4 Indie Labels and Major Labels

12.4.1 Why Most Bands and Songwriter-Performers Don't Get Label Deals

Bands and solo artists struggling to get signed to a name-brand indie label or a major label usually assume that artists on those labels who write their own material and sell millions of records are good songwriters who are writing the right kinds of songs to be commercially successful.

Not true (with a few exceptions). At least the part about being good songwriters.

Most label artists who write their own songs write mediocre stuff. Many sell millions of records, but for lots of other reasons that have nothing to do with great songwriting ability.

Year after year, zillions of bands and solo songwriter-performers inundate major labels and large indie labels with piles of demo CDs. What's on those demos? The same kinds of generic songs they hear on commercial radio and college radio. "Wickerwork" music, or "modern art" music. Generic hard rock, generic hip-hop, generic country, generic R &B.

The Labels Don't Have Tin Ears; Songwriters Have Tin Pens

It's not true that record company A & R personnel can't tell the difference between great songwriting and run-of-the-mill songwriting. There's practically no great songwriting on those demos (even though A & R reps insist the bands they sign write superlative material). The songs on the demos represent thousands of different flavours of mediocrity. The job of A & R is to select a few of those acts every year to

sign and develop into, they hope, *profitable* acts. Most new acts don't work out and get dropped within a few years at most. A few do work out and sell hundreds of thousands, or even millions of records—but not on the strength of the songwriting.

Record companies are always on the lookout for artists with extraordinary songwriting ability.

Suppose Lennon and McCartney had been born in the 1980s instead of the 1940s. And suppose that, between 2002 and 2010, they wrote the same 180-plus songs as they wrote between 1962 and 1970. Would a major label sign them? Would millions of people worldwide embrace their songs the way they did in the 1960s? Would the songs go on to become classics?

Given the quality of Lennon-McCartney songs, yes, yes, yes, without a doubt. That's how good—and how timeless—the *songs* actually are.

Between them, Lennon and McCartney had nailed musical and lyrical composition technique by the time they started writing songs, some *five years* after they met. Before they ever wrote a song, they spent thousands of hours playing together, covering well-written popular songs, and learning about songwriting.

If labels are turning a deaf ear to your music, it means several things:

1. Your songs are merely okay at best—not extraordinary.

2. You haven't slogged it out in the clubs for five to eight years or so, playing mainstream generic music for crowds of drinkers and selling 20,000 to 40,000 CDs over that period of time. (Persistence like that will attract label attention, no matter how pedestrian the music is.)

If the industry is not taking notice of your demos and your act, then you need to go back to the proverbial drawing board and drastically improve either your songwriting skills or your signature sound and style or both. If you want to get a label deal and you don't specialize in run-of-the-mill party music for drunks, there's simply no substitute for putting in the time and effort it takes to learn effective songwriting skills and to develop a signature sound and style.

If you're starting from scratch, it will take you several years because there's so much detail to learn, understand, and absorb into your musical DNA (Chapters 6 through 11). If you are not willing to put in the kind of time and effort it takes to learn those skills, it's highly unlikely a major label or name-brand indie label will pick you out of the vast herd of other ordinary bands and songwriter-performers.

12.4.2 HOW TO GET SIGNED

> It's dangerous to have a corporation, to have a staff of 15 guys tell you what they think you should do. It stops becoming art. When the uncreative tell the creative what to do, it stops becoming art.
>
> —TONY BENNETT

Suppose you decide you'd rather not become an independent label-owning entrepreneur. You'd sooner go the traditional route and try to get a deal with an established indie or major label.

Or suppose you started as an independent artist and you've gone as far as you can go, and now you want to get signed, even if it means starting at the bottom all over again.

And suppose that:

- You've gone back to the drawing board and spent several years getting skilled as a composer and lyricist, and now your songs truly are consistently brilliant;

- You've spent a lot of time exploring other genres and truly have developed a signature sound and style; and

- You're making your music available to the public, the media (getting raves), and the industry through demo packages sent to labels, through your website (where you have two or three 10-song CDs of original songs for sale), and through other Internet outlets.

Now what are the odds that a major label or a large, reputable independent label (as opposed to a small, cottage-industry-type label) will offer you a deal?

Given all of the above: dang good. Bands and songwriter-performers who write truly brilliant material are extraordinarily rare because practically all songwriters are clueless about musical and lyrical composition technique.

A name-brand indie or major label will probably want to sign you. Maybe even before you have much experience as a performer. More likely, though, you'll need to get some gigging experience, a credible manager, and a reputable agent.

When you sign with a large indie or major label, you normally have to make corporate-radio-friendly records and videos, and put on a visually-oriented spectacle-type live show. However, if you really are the Next Big Thing as a *songwriter*-performer (someone as skilled and imaginative as Tom Waits, Tori Amos, Dylan, Bjork, Joni Mitchell, or Leonard Cohen), the folks at the label won't mess with you much.

The song is the currency of the music business. If you're writing brilliant, top-of-the-Wundt-curve songs, many people are going to find out about your songs and buy

your CDs, even if you don't get commercial radio airplay. You're going to sell enough records to make the label happy, and attract good crowds to your shows, even if you don't have a splashy visual act. Other artists covering your songs will also likely sell a lot of records. Your label (which may own a piece of your publishing) will do alright financially, thanks to the value of your songwriting currency.

The label will fund the recording of your CD and provide other funds related to getting your music out there. The record company takes a risk. If your record flops and the label drops you, you will not have to pay back the hundreds of thousands of dollars the label spent on you and your record. However, if your record sells well, all that label-advanced money is recoupable from the *artist royalties* you are entitled to as the performer on your CD. To be clear: you will not get an artist royalty cheque until all the money the record company spent on you has been recouped from your artist royalty account. And that may take years. You may never see an artist royalty cheque. It's not unusual for a CD to sell several hundred thousand units, with the artist never getting a dime in artist royalties.

But that doesn't mean you'll starve. You will get other royalties and fees. The following sources of income are not recoupable by the record company:

- ***Mechanical royalties.*** The record company must pay you as a *songwriter* for the use of your songs on your own record (and any covers of your songs recorded by other artists). An agency collects *mechanical royalties* from the record company on your behalf (Harry Fox Agency in America, CMRRA in Canada). This is one main reason for you *not* to co-write, especially with someone who knows less about songwriting than you know. If you alone write all 10 songs on a CD, you get maximum songwriter mechanical royalties. If you co-write, your income gets slashed drastically.

- ***Performing rights royalties.*** Radio and television stations (and Muzak, and movies, and restaurants, etc.) must pay you as a *songwriter* for the right to broadcast recordings of your songs to the public. An agency collects performing rights royalties on your behalf (ASCAP, BMI, PRS, and others). Again, if you co-write, you lose a huge amount of this income.

- ***Personal appearance fees.*** This is the money you get for performing live. If you need tour support from a label, those funds are recoupable. With the push of a record label, a lot of people will get to know your music, so you will be able to play to larger and larger crowds, more and more frequently. After a while, you won't need tour support and your personal appearance fee will go up. You will likely have opportunities to open for well-known acts (usually label-mates) before headlining your own shows.

- ***Merchandising.*** You get a share of the revenue from the sale of T-shirts, photos, etc. However, it's not a large percentage when you're on a label. This income gets split many ways.

If your record label were to drop you (the fools!), you'd still be able to continue touring on your own terms. But you would not have the right to sell, on your own website at full retail, your label-recorded CDs, nor the individual tracks from those CDs.

You could seek a deal with another label or establish yourself as an independent entrepreneurial songwriter-performer. If you were to decide to become independent, you would be able to exploit the commercial potential of a fan base much larger than the fan base you would have had, if you had never been on a name-brand label.

12.4.3 BUZZ, BRANDING, AND (MOSTLY) BLIND DUMB LUCK: WHAT YOU NEED TO BECOME A BIG TIME ROCK/HIP-HOP/COUNTRY STAR

Hardly any bands and songwriter-performers have the skills to write great songs. Yet major labels know how to pluck a mediocre band or songwriter-performer from obscurity and turn that band or person into a multi-platinum-selling star.

How do they do it?

Record companies know that millions of people buy songs crafted with some skill but no imagination *provided recordings of such songs get lots of radio airplay*. A single getting airplay is advertising for the CD and promotion for the artist. That's why record labels put enormous resources into cultivating relationships with radio station personnel. Competition to get a track added to a station's playlist is fierce. Every commercial radio station gets piles and piles of new releases every week but only adds one or two new tracks to the playlist.

A radio station is more likely to add a record under certain conditions:

- Radio station personnel know or at least have met the performer and staff from the performer's record company. That's why newly-signed acts go on "radio tours"—meet-and-greets or showcases at radio stations.

- The production on the record conforms to stereotypical conventions of currently-charted records in the genre.

- The lyrics of the song conform to stereotypical conventions of currently-charted records in the genre (in country music, that means mainly Generic Artless Relationship Lyrics).

- The record has a buzz—it's rising on the charts, not falling.

- The performer and label are name brands.

Record companies also know that an act will attract hordes of fans to live performances, even though the act's songs are mediocre, *if those songs are glamourously packaged and delivered in concert.* That means the act's show must feature:

- Elaborate staging and costumes
- Sensational lighting effects
- Great instrumental playing
- Constant strutting, dancing, and jumping around on stage
- Lots of booze and related hedonic substances for the audience

In short, an audience-involved spectacle and party.

So when a major label decides to sign a new act to develop as a potential rock or country star, the label does not expect the performer to have the songwriting skills of Hank Williams, Sr. or John Lennon.

Instead, the record company selects would-be stars who meet certain criteria, characteristics the label can package and use to sell hundreds of thousands or millions of CDs and concert tickets.

If you aspire to such stardom, all you need to do is:

1. Meet the criteria listed below (nothing to do with songwriting skill)

2. Show how determined you are by playing constantly and moving several thousand CDs of your songs every year, mostly at your gigs, for at least five years

3. Be unbelievably lucky, because lots of acts meet the criteria

Here are the minimum qualifications—"potential star criteria"—you need in order to be considered for the job:

- ***Youth.*** Major labels sign performers in the 16 to 28 age range. It's not an arbitrary policy that the *Idol* cut-off age is late twenties: the top few *Idol* contestants are destined for major labels.

- ***Sex appeal.*** Female performers must be slim and gorgeous. Males must be hunky and good-looking.

- ***Passable vocal ability.*** This is more important in country than in rock, where off-key singing is accepted and even desirable.

- ***Stereotypical look of the genre.*** A country or rock or hip-hop act must have the stereotypical look (clothing, hair, tattoos, etc.) of a performer working in the genre.

- ***Stereotypical personality of the genre.*** A country act, for example, typically has to come across as God-fearing, down-home, down-to-earth.

- ***Charisma/stage presence.*** The performer must have the ability to personally connect with an audience.

- ***Team player.*** The record company needs to be satisfied that the performer will do whatever the company "suggests" to advance his or her career.

- ***Work ethic and dedication.*** The performer must be willing to work long, hard hours, even when it means losing touch with family and friends.

Members of rock bands usually have the ability to write their own passable, genre-appropriate stereotypical songs. However, if a performer meets all the potential star criteria but does not write songs, the record company can employ a writing/production committee ("factory") that specializes in crafting such songs. In country music, if the newly-signed performer does not have adequate skills to write mediocre country material, the record company can easily get a supply of such songs from Nashville song publishers.

Once the lucky new act has been signed, the label authorizes the expenditure of a considerable amount of *recoupable* money to produce the act's debut CD and video, and to process the newly-signed act into a salable package. Packaging usually isn't difficult because the act has been selected in accordance with packaging criteria, and only needs some polishing.

With the release of the single, video, and CD, the performer "tours the product" in several ways:

- Radio station touring—to showcase the single and to personally connect with radio station staff as part of the label's effort to get the single added to commercial radio playlists

- Personal appearances at large retail outlets (record companies pay for rack space in stores such as Wal-Mart, Tower, Virgin, etc.)—to get friendly with retail personnel and to attract media attention

- Opening-act touring with star label-mates

If the label has selected their new act shrewdly and promoted the act heavily, the new performer becomes a personality who convincingly delivers genre-appropriate craft-songs. Large numbers of fans connect emotionally with his or her persona and buy concert tickets, CDs, T-shirts, hoodies, hats, posters, photos, key-chains, coasters, bottle openers, lighters, even books comprised of the performer's immortal blog musings ("if you blog it, you can flog it")—anything connected with the charismatic performer, who becomes a bona-fide star.

Example of the Buzz (or Bandwagon) Effect

> *... false media*
> *We don't need it, do we?*
> *It's fake that's what it be to ya, dig me? ...*
> *Don't, don't, don't, don't, don't believe the hype*
> *Don't, don't, don't, don't, don't believe the hype*
> —C. RIDENHOUR, H. SHOCKLEE, W. DRAYTON, & E. SADLER, recorded by PUBLIC ENEMY ("Don't Believe The Hype")

In the music industry, managers, agents, labels, the music media, and others try to get a buzz going for a new act or a new song.

Does it work?

Researchers at Columbia University investigated some factors that influence how music fans select one song over another. More than 14,000 participants (visitors to a music-downloading website *who did not know they were participants in an experiment*) were invited to check out new songs from a list of 48 MP3s by downloading and rating the songs they selected on a scale of 1 to 5.

Some of the participants (called "social influence" groups) could see which songs others were selecting and rating. The members of these groups tended to choose the same songs they saw others in their group selecting, and tended to rate them the same way, ***even though none of the participants had ever heard any of the songs before.***

Another group (the "independent" group) could not see which songs others were choosing and rating. They rated the songs much differently, compared with the social influence groups.

The researchers found that buzz (the bandwagon effect) significantly affected song choice—*irrespective of song quality*. Song quality (as indicated by the ratings of the independent group) played a role in the social influence groups, but buzz had a powerful effect.

For example, one particular song that ranked in the middle of the pack by the independent group (#26 out of 48) ranked #1 in one of the social influence groups, simply because, by chance, it started getting more downloads at the outset. Others in that social influence group perceived the early download pattern as a buzz, jumped on the bandwagon, and sent the song to the top of the charts. And yet, in another of the social influence groups, the very same song by chance did not get a lot of downloads at the outset. In other words, the song that climbed to #1 on a chart of 48 songs when it had the buzz/bandwagon effect going for it ended up ranking #40 out of 48 when participants, by chance, did not perceive the song had a buzz.

As you'll see in a minute, the buzz/bandwagon effect is why payola works.

Example of the Brand Loyalty Effect

In the 1980s and 1990s, Pepsi Cola ran a series of television commercials called the "Pepsi Challenge." These commercials presented fake scenarios in which passers-by in a shopping mall would taste both Pepsi and Coke without knowing which was which, and would always indicate a preference for Pepsi.

In a laboratory-controlled study of the "Pepsi Challenge" scenario, the results differed wildly from the phony results of the TV commercials. Instead of preferring Pepsi over Coke, groups of blindfolded tasters preferred the taste of each soft drink with equal frequency.

But when groups of tasters could see the *logos* identifying which soft drink was which, three-quarters of the tasters claimed they preferred Coke over Pepsi, ***even though, under blind conditions, no such preference choice could be demonstrated.***

The neuroscientists who conducted the study measured brain activity while the tasters were exposed to the Coke and Pepsi logos. Mere exposure to the Coke logo stimulated much more mental activity in areas of the brain associated with memory and self-image, compared with exposure to the Pepsi logo.

To summarize, in "blindfolded" conditions, people do not prefer Pepsi to Coke, nor Coke to Pepsi. It's 50-50. But in logo-identified conditions, preference for Coke over Pepsi shoots up to 75-25. The Coca Cola corporation has done an effective job, through constant branding activity, of creating a powerful, positive meme. Coke is a high-EPA word. People buy into the *myth* that Coke tastes better than Pepsi for reasons that have nothing to do with the taste of either soft drink. It's all about the power of propaganda alone—advertising and promotion—to change and shape behaviour without changing objective reality (in this example, the objective reality that Coke-Pepsi preference is 50-50 in the absence of brand identification). Under sinister circumstances, this is called brainwashing.

Buzz and Payola

Brand loyalty affects buying decisions in the music industry as much as it does in the soft drink industry or any other industry. So does the buzz (or bandwagon) effect.

Record companies manipulate the buying behaviour of music fans by leveraging both buzz and brand loyalty. A major label has and uses its power to transform a recording of a mediocre song by a performer of modest ability into a hit song by a star—without changing the objective reality: the song is still mediocre, and the performer's ability is still modest.

A new but unremarkable recording by an unexceptional performer can become a hit single (leading to a hit CD) if the record label can simply get radio stations to play its mediocre record more often than the other mediocre records.

When *any* record gets into heavy rotation, listeners mistakenly believe the record is getting played so frequently because a lot of their peers are requesting or buying the record. Not be left out, listeners then react by creating a buzz where none existed. The *appearance* of popularity becomes *real* popularity. Listeners *actually* request the song with increasing frequency, and *actually* purchase the track. Sales soar and the song becomes a hit.

The performer benefits from his or her association with the popularity of the hit song. Radio stations jump on the bandwagon (now the *performer*, not just the song, has big-time buzz) by adding subsequent new singles by the performer to their playlists. Over time, ongoing performer popularity resulting from having multiple hits becomes performer brand loyalty, and the performer becomes a star.

Many rock, hip-hop, country, and R & B acts—both solo performers and bands—each sell millions of singles, albums, and concert tickets, year after year, even though they have no more innate talent than an average lounge singer or bar band. It's all about branding. Their fans buy their records for the same reason people buy Coca-Cola: because the star *as a brand* makes them feel good, not because the star is actually a superlative performer or songwriter—just as Coca Cola's feel-good brand makes people buy it, even though, in reality, Coke is not actually a better-tasting soft drink.

Payola—illegal payment for promotion (i.e., bribery)—can turn an ordinary performer into a lucrative brand-name star. That's why payola has always existed in the music industry and continues today. Thanks to the buzz effect, payola works.

In the early days of the industry, sheet music publishers paid artists to promote songs. With the decline of print music, the payola players changed. By the 1950s, record companies were paying radio station personnel to add songs to playlists, a practice that has never gone away.

Every so often, major labels get busted for payola and have to pay multi-million-dollar fines. It's just a cost of doing business.

One tactic the major labels now use to get around anti-payola legislation, is to hire so-called "independent promoters" to promote records on behalf of the label.

Instead of the major label paying off radio station personnel directly, they use indie promoters as intermediaries.

Another stratagem the majors use that isn't technically payola is purchasing airplay for songs as advertising time—a practice initiated by radio stations. The radio station must, by law, mention that a label is sponsoring a spin: "Here's the latest from (name of artist), presented by (name of record company)." The entire track gets played (not just a 30- or 60-second excerpt), and the listener hardly notices or doesn't even realize it's a *paid* spin. This form of promotion is expensive, but it can keep a record on the *Billboard* chart, ensuring that it doesn't start slipping down. The effect is to create the illusion that the song is becoming a big hit (the buzz effect). The song's chart performance persuades some radio station program directors to get on the bandwagon and add the song to the station's playlist, and dissuades others from dropping the track.

12.4.4 THE FUTURE: HIT? SONG? SCIENCE?

"Hit Song Science" (HSS) is a computer program that record companies and recording artists use to try to ensure that their new records conform to generic *Billboard* record production values.

Computer programmers in Spain claim they computer-analysed 3.5 million recordings (not songs, recordings) from the 1950s on. The program could only scan the elements a computer is capable of scanning from a sound file, such as tempo, recurrent patterns, pitch, and other such variables.

The computer could not recognize evidence of musical imagination, of course.

Nor lyrics. Music only.

Also, hardly any of the 3.5 million recordings "analysed" were actually hits. The number of records that have been on the *Billboard* charts over five decades numbers only in the thousands, not millions, and the number of *Billboard* hits only a fraction of charted records.

For marketing reasons, the programmers called their computerized creation "Hit Song Science" instead of "Non-hit Recorded-Music-Conformity Computer Scanning," which, while a lot closer to the truth, would not have attracted too many customers.

For a fee, record companies and individual musicians can run unreleased recordings through the HSS computer program to analyse it for "hit potential."

Some record labels, always eyeing the *Billboard* charts, see HSS as the way of the future, even though HSS is a piece of software built exclusively on the instrumental music of past recordings, the great majority of them non-hits. It's a label executive's dream to think the label could continuously run new song files (never heard by human ears at the record company) through the HSS software until HSS finds a track

that causes the computer to buzz, flash, and pronounce, in its synthesized voice, "Hit song potential! Hit song potential!"

To summarize, there's no "Hit," no "Song," and no "Science" in "Hit Song Science":

- ***Hit?*** The program was devised overwhelmingly from non-hits (see above). There have not been anything remotely close to 3.5 million hits in the history of recorded music.

- ***Song?*** Most songs have *lyrics*, and lyrics are married to music. HSS does not "analyse" either the lyrics or their interaction with the music. Also, the program is built on a digital audio file of only one, or at most several, recorded arrangements of the music (only) of each song, even though any given song can be arranged and recorded by thousands of different artists in thousands of different ways.

- ***Science?*** Believing in HSS is like believing in astrology or cargo-cult religion. There's no science in "Hit Song Science." That is, there's no empirical evidence that a prediction made by the HSS computer program has any relationship to the commercial success or failure of a recording. If an unreleased recording gets a high HSS score but the record tanks (the usual case), the company behind HSS can always claim the song did not become a hit because it was poorly promoted, or because the record just didn't have the right sound, or the lyrics were no good, or some other excuse. Not their fault. But if an unknown record gets a high HSS score and does become a hit (rare), the HSS people can quickly take the credit and trumpet the "success" of their software in "predicting" the hit. Worst of all, when HSS customers hear the word "science," they undoubtedly connote scientific credibility with HSS results. As Paul Simon's "Boxer" put it, "A man hears what he wants to hear and disregards the rest."

Curious about the brave new world of computerized hit-picking? You can have HSS analyse *your* songs, if you want to. Just hip-hop on down to www.HitSongScience.com, especially if your sign is Gemini and the 13th rising moon of Saturn is in the process of aligning with the 19th state of the inverted house of Betelgeuse. Oh, and bring along a valid credit card.

Epilogue:
A Horse Walks Into A Bar

As you know, it’s traditional to end a Classic Western with a haiku.

Ms Puma smiles as
A horse walks into her bar
“So, why the long face?”

Resources and References

Appendix 1

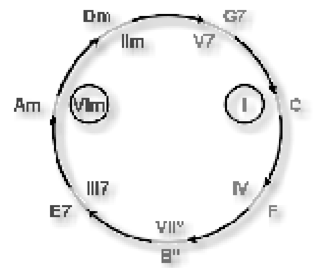
Roedy Black's Chord Progression Chart

See Chapter 6 for details on how to use Roedy Black's Chord Progression Chart, reproduced on the next two pages.

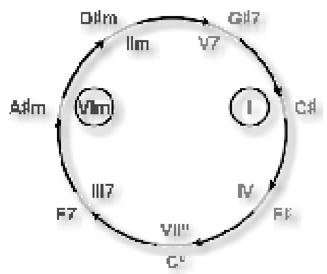
Roedy Black's Chord Progression Chart

Harmonic Scales with Nashville Numbers for All Major and Minor Keys

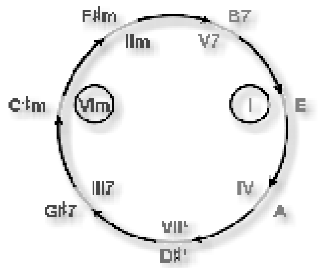
Key of C major / A minor



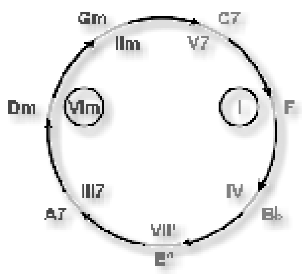
Key of C♯ major / A♯ minor



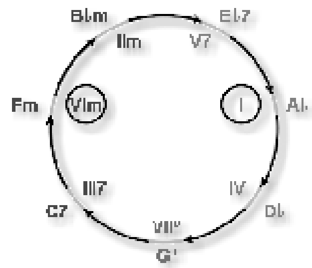
Key of E major / C♯minor



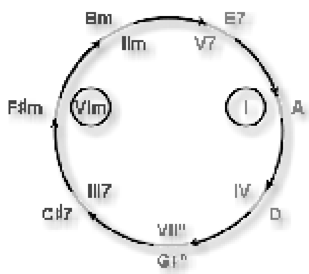
Key of F major / D minor

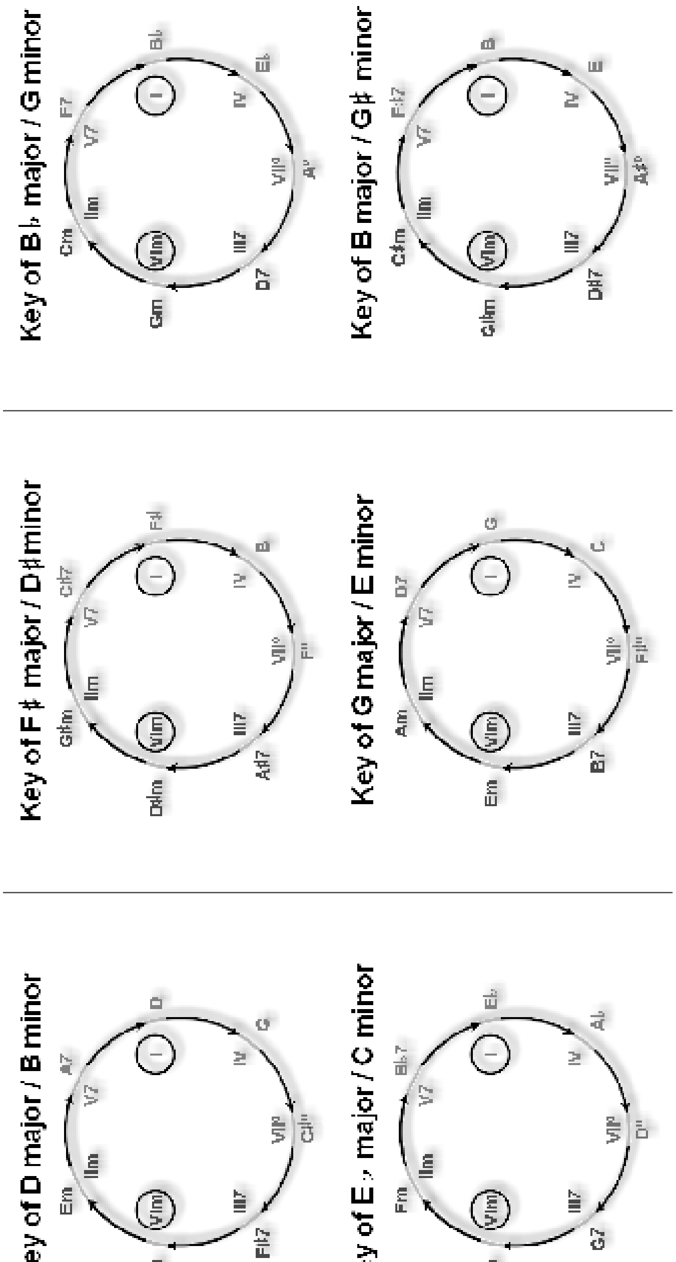


Key of A♭ major / F minor



Key of A major / F♯ minor




Key of D major / B minor
Key of F♯ major / D♯minor
Key of B♭ major / G minor
Key of E♭ major / C minor
Key of G major / E minor
Key of B major / G♯ minor

Appendix 2

Useful Websites and Resources

As you know, there are approximately 8.7 gazzillion music-related websites and organizations. Here are a few you may find useful.

www.AFM.org
www.Allmusic.com
www.AllRecordLabels.com
www.ArtistShare.com
www.ASCAP.com
www.Bandname.com
www.BanditNewsletter.com
www.BlizzardRecords.com
www.BMI.com
www.CDBaby.com
www.CheckDomain.com
www.CompleteChords.com
www.Copyright.gov
www.DirtyLinen.com
www.Epitonic.com
www.EMPLive.com
www.Folk.org
www.geocities.com/Songshark/
www.GoldStandardSongList.com
www.Harmony-Central.com
www.HarryFox.com
www.IUMA.com
www.MooseNobel.com
www.MP3.com
www.MPA.org/Directories/
www.MusesMuse.com
www.MusikPlaza.de
www.MusicRegistry.com
www.MusicYellowPages.com
www.NAMM.com
www.Pandora.com
www.PeopleSound.com
www.ProjectOpus.com
www.PRS.co.uk
www.RecordProduction.com
www.RoedyBlack.com
www.SESAC.com
www.Songlink.com
www.Songramp.com
www.Songstuff.com
www.Songwriter.com
www.Songwriter.co.uk
www.Songwriters-Guild.co.uk
www.Taxi.com
www.TheBaffler.com/AlbiniExcerpt.html
www.TheOrchard.com
www.U-G-A.com
www.UrbanDictionary.com
www.USPTO.gov
http://.Music.Podshow.com

And some websites from the text of *How Music REALLY Works!*, 2nd Edition:

www.AmericanBrandstand.com
www.AndreaFlorian.com

www.Angelfire.com/ny/MetalBabe/Glamname.html
www.BandNameMaker.com/d/index.html
www.BobDylan.com
www.Bookblog.net/Gender/Genie.html
www.ChrisBliss.com
www.Dilbert.com
www.FerronOnline.com
www.FredEaglesmith.com
www.GatewayArch.com
www.GearChange.org
www.HitSongScience.com
www.HopeInAmerica.com
www.Huutajat.org
www.Improb.com/Projects/Hair/Hair-club-top.html
www.Irielion.com/Israel/Reggaename.html
www.JaneSiberry.com
www.Janisian.com
www.JimHallMusic.com
www.JodelAndMore.com
www.KissThisGuy.com
www.LVBeethoven.com/Oeuvres/Music_MidiSonatasPiano.html
www.MandolinCafe.com/Archives/Bandnames/
www.MusicLinkFoundation.org
www.Newmoon.uk.com/Wicca/Name.html
www.NPL.Washington.edu/av/altvw104.html
www.PaulaToledo.com
www.PopCultureMadness.com/Music/WORST-Nikki.html
www.QuinlanRoad.com
www.Randi.org
www.R-DS.com/Opera/Resource.htm
www.RighteousBabe.com
www.Science-Groove.org/SSA/
www.Shaggs.com
www.SkaggsFamilyRecords.com
www.SloanMusic.com/a/Murderecords
www.SongTapper.com
www.TheyMightBeGiants.com
www.ThisDayInMusic.com/Member/BirthdayNo1.php
http://CountryStarName.com/index.php
http://DouglassArchives.org/IHaveADream.txt
http://Foodsafe.ucdavis.edu/music.html
http://Members.aol.com/Valdes379/EmoGame.html
http://Noosphere.Princeton.edu
http://PopStarName.com/index.php
http://RapStarName.com/index.php
http://RockStarName.com/index.php
http://TheReallyTerribleOrchestra.com
http://Tisue.net/Jandek/
http://Viscog.Beckman.Uiuc.edu/djs_lab/demos.html

Appendix 3

Winners of the Moose Nobel Prize in Music, 1901 - 2006

As you know, the Moose Nobel Prize in Music is the world's most prestigious music prize. Recipients are announced annually on January 27th by the Moose Nobel Committee of H.U.M.S.

This appendix lists all Moose Nobel laureates from 1901 to 2006. For complete information on the Moose Nobel Prize in Music (the world's most prestigious music prize), including additional sortings of all the laureates by genre and artist, visit the Moose Nobel website: www.MooseNobel.com.

2006	Domino, Fats, 1928 - , pioneering R & B singer and songwriter
2006	Chieftains, The, 1962 - , traditional Irish music group
2006	N'Dour, Youssou, 1959 - , mbalax singer and bandleader
2006	Zawinul, Joe, 1932 - , jazz composer and keyboardist
2005	James, Etta, 1938 - , blues singer
2005	Public Enemy, 1982 - , hip-hop group
2005	Wells, Kitty, 1919 - , country singer
2005	Dr. Dre, 1965 - , rap artist
2004	Bowie, David, 1947 - , rock songwriter, singer, and record producer
2004	Nilsson, Birgit, 1918 - 2005, soprano
2004	Paul, Les, 1915 - , guitarist, guitar designer, and recording innovator
2004	Wonder, Stevie, 1950 - , soul, R & B, and rock singer and songwriter
2003	Bambaataa, Afrika, 1960 - , DJ
2003	Sakamoto, Ryuichi, 1952 - , composer and pianist
2003	Waits, Tom, 1949 - , jazz and soul songwriter, singer, pianist, and guitarist
2003	Toure, Ali Farka, 1949 - , guitarist, singer, and songwriter
2002	John, Sir Elton, 1947 - , and Bernie Taupin, 1950 - , songwriters
2002	Lightfoot, Gordon, 1938 - , folk songwriter and singer
2002	Jackson, Michael, 1958 - , singer, songwriter, and record producer
2002	Simmons, Russell, 1957 - , pioneering hip-hop producer and label owner
2001	Run-DMC, 1982 - 2002, hip-hop group
2001	Spector, Phil, 1940 - , record producer and songwriter
2001	Eno, Brian, 1948 - , and David Byrne, 1952 - , songwriters and producers
2001	Theodorakis, Mikis, 1925 - , composer
2000	Sinopoli, Giuseppe, 1946 - 2001, conductor and composer
2000	Young, Neil, 1945 - , songwriter, singer, and guitarist
2000	Morrison, Van, 1945 - , soul, blues, jazz, and folk songwriter and singer
2000	Grandmaster Flash, 1957 - , DJ and hip-hop pioneer

1999	Kraftwerk, 1970 - 2000, electronic pop group
1999	Lee, Peggy, 1920 - 2002, jazz and pop singer and songwriter
1999	Tebaldi, Renata, 1922 - 2004, soprano
1999	Nelson, Willie, 1933 - , country singer and songwriter
1998	Bhosle, Asha, 1933 - , singer
1998	Kool DJ Herc, 1955 - , DJ and hip-hop pioneer
1998	Reich, Steve, 1936 - , composer
1998	Peterson, Oscar, 1925 - , jazz pianist and composer
1997	Mayfield, Curtis, 1942 - 1999, soul, funk, and R & B singer and songwriter
1997	Livingston, Jay, 1915 - 2001, and Ray Evans, 1915 - , songwriters
1997	Strouse, Charles, 1928 - , songwriter
1997	Wilson, Brian, 1942 - , rock and pop songwriter, singer, and producer
1996	Khan, Nusrat Fateh Ali, 1948 - 1997, Qawwali singer
1996	Belafonte, Harry, 1927 - , singer
1996	Santana, Carlos, 1947 - , guitarist and songwriter
1996	Simon, Paul, 1941 - , pop and rock songwriter and singer
1995	Steeleye Span,1969 - 1996, folk-rock group
1995	Shakur, 2pac, 1971 - 1996, rap artist
1995	Franklin, Aretha, 1942 -, soul, R & B, and gospel singer
1995	Robinson, Smokey, 1940 - , soul and R & B singer and songwriter
1994	Ramones, The, 1975 - 1995, punk rock band
1994	Grateful Dead, The, 1965 - 1995, rock band
1994	Kuti, Fela, 1938 - 1997, Afrobeat multi-instrumentalist, songwriter, and singer
1994	Pavarotti, Luciano, 1935 - , tenor
1993	Leiber, Jerry, 1933 - , and Stoller, Mike, 1933 - , songwriters
1993	Ade, King Sunny, 1946 - , juju bandleader, singer, and drummer
1993	Moog, Robert, 1934 - 2005, designer and inventor of electronic instruments
1993	Jarre, Maurice, 1924 - , composer of film music
1992	Zappa, Frank, 1940 - 1993, songwriter, guitarist, and singer
1992	Clinton, George, 1945 - , funk musician and songwriter
1992	Mitchell, Joni, 1943 - , songwriter, singer, and guitarist
1992	Little Richard, 1932 - , R & B and rock singer, songwriter, and pianist
1991	Lutoslawski, Witold, 1913 - 1994, composer
1991	Cash, Johnny, 1932 - 2003, country singer and songwriter
1991	Ligeti, Gyorgy, 1923 - , composer
1991	Cohen, Leonard, 1934 - , songwriter and singer
1990	Queen, 1970 - , rock band
1990	Masekela, Hugh, 1939 - , cornet and flugelhorn player
1990	Jones, George, 1931 - , country singer and songwriter
1990	Sondheim, Stephen, 1930 - , songwriter
1989	Bradley, Owen, 1915 - 1998, country record producer
1989	Charles, Ray, 1930 - 2004, R & B and soul singer, pianist, and songwriter
1989	Shankar, Ravi, 1920 - , sitar player and composer
1989	Blackwell, Chris, 1937 - , producer and record label founder
1988	Who, The, 1964 - 1989, rock band
1988	Stockhausen, Karlheinz, 1928 - , composer and educator
1988	Ferrer, Ibrahim, 1927 - 2005, bolero singer
1988	Gilberto, Joao, 1931 - , singer, guitarist, composer, and co-creator of bossa nova
1987	Morricone, Ennio, 1928 - , composer
1987	Haggard, Merle, 1937 - , country singer and songwriter
1987	Brown, James, 1928 - , soul and funk singer, songwriter, and bandleader
1987	Bacharach, Burt, 1928 - , and Hal David, 1921 - , songwriters
1986	Baker, Chet, 1929 - 1988, jazz trumpeter and singer
1986	Bennett, Tony, 1926 - , singer
1986	Rostropovich, Mstislav, 1927 - , cellist, composer, and conductor
1986	Gordy, Berry, 1929 - , R & B and soul songwriter and label owner

1985	Davis, Miles, 1926 - 1991, jazz trumpeter and bandleader
1985	Jobim, Antonio Carlos, 1927 - 1994, composer and co-creator of bossa nova
1985	Mighty Sparrow, 1935 - , calypso singer and songwriter
1985	Deep Purple, 1968 - , hard rock and early heavy metal band
1984	Blakey, Art, 1919 - 1990, jazz drummer and bandleader
1984	Boulez, Pierre, 1925 - , composer and conductor
1984	Jones, Quincy, 1933 - , producer and songwriter
1984	King, B. B., 1925 - , blues singer, guitarist, and songwriter
1983	Gaye, Marvin, 1939 - 1984, soul and R & B singer and songwriter
1983	Wilson, Jackie, 1934 - 1984, soul and R & B singer
1983	Bryant, Boudleaux, 1920 - 1987, and Felice Bryant, 1925 - 2003, songwriters
1983	Mouskouri, Nana, 1936 - , singer
1982	Vaughan, Sarah, 1924 - 1990, jazz singer
1982	Pink Floyd, 1965 - 1994, rock band
1982	Rich, Buddy, 1917 - 1987, jazz drummer, singer, and bandleader
1982	Jagger, Mick, 1943 - , and Keith Richards, 1943 - , songwriter-performers
1981	Clash, The, 1977 - 1982, punk rock band
1981	Gould, Glenn, 1932 - 1982, pianist and composer
1981	Berio, Luciano, 1925 - 2003, composer
1981	Vigneault, Gilles, 1928 - , songwriter and singer
1980	Marley, Bob, 1945 - 1981, reggae singer, songwriter, and bandleader
1980	Puente, Tito, 1923 - 2000, Latin jazz and salsa percussionist and bandleader
1980	Martin, Sir George, 1926 - , record producer, arranger, and composer
1980	McCartney, Sir Paul, 1942 - , rock and pop songwriter and singer
1979	Led Zeppelin, 1968 - 1980, blues-rock and early heavy metal band
1979	Evans, Bill, 1929 - 1980, jazz pianist
1979	Lennon, John, 1940 - 1980, rock and pop songwriter, singer, and guitarist
1979	Xenakis, Iannis, 1922 - 2001, composer
1978	Mingus, Charles, 1922 - 1979, jazz bassist, composer, and bandleader
1978	Travis, Merle, 1917 - 1983, country singer, songwriter, and guitarist
1978	Williams, Joe, 1918 - 1999, jazz singer
1978	Berry, Chuck, 1926 - , and Johnnie Johnson, 1924 - 2005, rock songwriters and performers
1977	Sex Pistols, The, 1975 - 1978, punk rock band
1977	Brel, Jacques, 1929 - 1978, singer and songwriter
1977	Stern, Isaac, 1920 - 2001, violinist
1977	Makeba, Miriam, 1932 - , singer
1976	Callas, Maria, 1923 - 1977, soprano
1976	Presley, Elvis, 1935 - 1977, rock and pop singer
1976	Band, The, 1967 - 1976, folk-rock group
1976	Gillespie, Dizzy, 1917 - 1993, jazz trumpeter, composer, and bandleader
1975	Mercer, Johnny, 1909 - 1976, and Henry Mancini, 1924 - 1994, songwriters
1975	Seeger, Charles, 1886 - 1979, and Pete Seeger, 1919 - , folk musicologists, songwriters, and singers
1975	Spence, Joseph, 1910 - 1984, folk and gospel guitarist and singer
1975	Menuhin, Yehudi, 1916 - 1999, violinist and conductor
1974	Holland, Brian, 1941 -, Lamont Dozier, 1944 - , and Eddie Holland, 1939 - , R & B and soul songwriters and record producers
1974	Flatt, Lester, 1914 - 1979, and Earl Scruggs, 1924 - , bluegrass duo
1974	Hammond, Sr., John, 1910 - 1987, jazz, folk, and rock record producer
1974	Snow, Hank, 1914 - 1999, country singer and songwriter
1973	Monk, Thelonious, 1917 - 1982, jazz pianist and composer
1973	MacColl, Ewan, 1915 - 1989, folk songwriter and singer
1973	Atkins, Chet, 1924 - 2001, guitarist and record producer
1973	Phillips, Sam, 1923 - 2003, rock record producer

1972	Tharpe, Sister Rosetta, 1915 - 1973, gospel singer and guitarist
1972	Waters, Muddy, 1915 - 1983. blues singer and guitarist
1972	Leclerc, Felix, 1914 - 1988, songwriter and singer
1972	Coleman, Ornette, 1930 - , jazz multi-instrumentalist and composer
1971	Funk Brothers, 1959 - 1972, R & B, soul, and funk studio band
1971	Frizzell, Lefty, 1928 - 1975, country singer and songwriter
1971	Tubb, Ernest, 1914 - 1984, country singer, songwriter, and guitarist
1971	Lomax, Alan, 1915 - 2002, folk song collector
1970	Doors, The, 1965 - 1971, rock band
1970	Britten, Benjamin, 1913 - 1976, composer, conductor, and pianist
1970	Brubeck, Dave, 1920 - , jazz pianist and composer
1970	Pentland, Barbara, 1912 - 2000, composer
1969	Carter Family, 1927 - 1970, country music group
1969	Hendrix, Jimi, 1942 - 1970, rock and blues guitarist, singer, and songwriter
1969	Joplin, Janis, 1943 - 1970, blues, rock, and soul singer and bandleader
1969	Lane, Burton, 1912 - 1997, songwriter
1968	Prima, Louis, 1911 - 1978, jazz trumpeter and singer
1968	Dixon, Willie, 1915 - 1992, blues songwriter, bassist, and singer
1968	Cage, John, 1912 - 1992, composer
1968	Dylan, Bob, 1941 - , songwriter, singer, guitarist, and harmonica player
1967	Piazzolla, Astor, 1921 - 1992, tango composer and bandoneon player
1967	Rota, Nino, 1911 - 1979, composer
1967	Stanley, Ralph, 1927 - , bluegrass singer and banjo player
1967	Khan, Ali Akbar, 1922 - , sarode player, composer, and educator
1966	Redding, Otis, 1941 - 1967, soul singer and songwriter
1966	Coltrane, John, 1926 - 1967, tenor and soprano saxophonist and composer
1966	Hermann, Bernard, 1911 - 1975, film composer
1966	Bernstein, Leonard, 1918 - 1990, composer, conductor, and pianist
1965	Strayhorn, Billy, 1915 - 1967, jazz composer, arranger, and pianist
1965	Chess, Leonard, 1917 - 1969, R & B record producer and label owner
1965	Khachaturian, Aram, 1903 - 1978, composer and conductor
1965	Sinatra, Frank, 1915 - 1998, singer
1964	Loesser, Frank, 1910 - 1969, songwriter and music publisher
1964	Walker, T-Bone, 1910 - 1975, blues guitarist, singer, and songwriter
1964	Howlin' Wolf, 1910 - 1976, blues singer, songwriter, and harmonica player
1964	Borge, Victor, 1909 - 2000, pianist, musical comedian, and conductor
1963	Cooke, Sam, 1931 - 1964, gospel and soul singer and songwriter
1963	Reeves, Jim, 1923 - 1964, country singer
1963	Turner, Big Joe, 1911 - 1985, blues and R & B singer
1963	Van Heusen, Jimmy, 1913 - 1990, Sammy Cahn, 1913-1993, and Johnny Burke, 1908 - 1964, songwriters
1962	Cline, Patsy, 1932 - 1963, country singer
1962	Piaf, Edith, 1915 - 1963, singer
1962	Cole, Nat King, 1917 - 1965, jazz and pop singer and pianist
1962	Fender, Leo, 1909 - 1991, inventor of solid-body electric guitar and bass
1961	Washington, Dinah, 1924 - 1963, jazz, blues, and pop singer
1961	Karajan, Herbert von, 1908 - 1989, conductor
1961	Monroe, Bill, 1911 - 1996, bluegrass singer, songwriter, and bandleader
1961	Hampton, Lionel, 1908 - 2002, jazz vibraphonist and bandleader
1960	Oistrakh, David, 1908 - 1974, violinist
1960	McPartland, Jimmy, 1907 - 1991, jazz cornetist
1960	Messiaen, Olivier, 1908 - 1992, composer and organist
1960	Fitzgerald, Ella, 1917 - 1996, jazz singer
1959	Guthrie, Woody, 1912 - 1967, folk songwriter and singer
1959	Shostakovich, Dmitry, 1906 - 1975, composer
1959	Calloway, Cab, 1907 - 1994, jazz singer and bandleader
1959	Grappelli, Stephane, 1908 - 1997, jazz violinist

1958	Asch, Moses, 1905 - 1986, folk music record producer and label owner
1958	Dorsey, Thomas Andrew, 1899 - 1993, blues and gospel songwriter and music publisher
1958	Styne, Jule, 1905 - 1994, Betty Comden, 1919 - , and Adolph Green, 1915 - , songwriters
1958	Tippett, Sir Michael, 1905 - 1998, composer
1957	Young, Lester, 1909 - 1959, tenor saxophonist and bandleader
1957	Teagarden, Jack, 1905 - 1964, jazz trombonist and bandleader
1957	Jackson, Mahalia, 1911 - 1972, gospel singer
1957	Lynn, Dame Vera, 1917 - , singer
1956	Holiday, Billie, 1915 - 1959, jazz singer
1956	Krupa, Gene, 1909 - 1973, jazz drummer and bandleader
1956	Wills, Bob, 1905 - 1975, western swing fiddler, singer, and bandleader
1956	Jordan, Louis, 1908 - 1975, jazz and R & B saxophonist and bandleader
1955	Basie, Count, 1904 - 1984, jazz bandleader and pianist
1955	House, Son, 1902 - 1988, blues singer and guitarist
1955	Acuff, Roy, 1903 - 1992, country singer, songwriter, and music publisher
1955	Carter, Benny, 1907 - 2003, alto saxophonist, trumpeter, and composer
1954	Andrews Sisters, 1932 - 1955, vocal trio
1954	Dorsey, Tommy, 1905 - 1956, and Jimmy Dorsey, 1904 - 1957, swing instrumentalists and bandleaders
1954	Fain, Sammy, 1902 - 1989, and Paul Francis Webster, 1907 - 1984, songwriters
1954	Horowitz, Vladimir, 1903 - 1989, pianist
1953	Rose, Fred, 1898 - 1954, country songwriter and record producer
1953	Parker, Charlie, 1920 - 1955, jazz alto saxophonist
1953	Berlin, Irving, 1888 - 1989, songwriter
1953	Goodman, Benny, 1909 - 1986, swing clarinettist, bandleader, and composer
1952	Reinhardt, Django, 1910 - 1953, jazz guitarist
1952	Tatum, Art, 1909 - 1956, jazz pianist
1952	Carmichael, Hoagy, 1899 - 1981, and Mitchell Parish, 1900 - 1993, songwriters
1952	Lerner, Alan Jay, 1918 - 1986, and Frederick Loewe, 1901 - 1988, songwriters
1951	Williams, Sr., Hank, 1923 - 1953, country singer and songwriter
1951	Hawkins, Coleman, 1904 - 1969, tenor saxophonist
1951	Armstrong, Louis, 1901 - 1971, jazz trumpeter, singer, and bandleader
1951	Crosby, Bing, 1904 - 1977, singer
1950	Bjorling, Jussi, 1911 - 1960, tenor
1950	Newman, Alfred, 1900 - 1970, conductor and composer of music for films
1950	Arlen, Harold, 1905 - 1986, E. Y. ("Yip") Harburg, 1898 - 1981, and Ted Koehler, 1894 - 1973, songwriters
1950	Anderson, Marian, 1899 - 1993, contralto
1949	Cotton, Billy, 1899 - 1969, jazz drummer and bandleader
1949	Coward, Sir Noel, 1899 - 1973, musical comedy songwriter and singer
1949	Suzuki, Shin'ichi, 1898 - 1998, music educator
1949	Shaw, Artie, 1910 - 2004, swing clarinettist, bandleader and composer
1948	McTell, Blind Willie, 1898 - 1959, blues singer and guitarist
1948	Ellington, Duke, 1899 - 1974, jazz composer, pianist, and bandleader
1948	Robeson, Paul, 1898 - 1976, bass-baritone
1948	Harris, Roy, 1898 - 1979, composer
1947	Williamson, the Original Sonny Boy, 1914 - 1948, blues singer and harmonica player
1947	Duke, Vernon, 1903 - 1969, songwriter and classical composer
1947	Copland, Aaron, 1900 - 1990, composer, pianist, and conductor
1947	Autry, Gene, 1907 - 1998, country singer
1946	Henderson, Fletcher, 1897 - 1952, jazz bandleader, composer, and pianist
1946	Formby, Jr., George, 1904 - 1961, music hall singer
1946	Sessions, Roger, 1896 - 1985, composer and educator
1946	Heifetz, Jascha, 1901 - 1987, violinist

1945	Bouchillon, Christopher, 1893 - 1968, originator of talking blues
1945	Henderson, Ray, 1896 - 1970, Lew Brown, 1893 - 1958, and Buddy De Sylva, 1895 - 1950, songwriters
1945	Klemperer, Otto, 1895 - 1973, conductor
1945	Orff, Carl, 1895 - 1982, composer and educator
1944	Hindemith, Paul, 1895 - 1963, composer, educator, and conductor
1944	Hurt, Mississippi John, 1894 - 1966, blues singer and guitarist
1944	Piston, Walter, 1894 - 1976, composer and educator
1944	Segovia, Andres, 1893 - 1987, Spanish guitarist
1943	Miller, Glenn, 1904 - 1944, swing trombonist and bandleader
1943	Youmans, Vincent, 1898 - 1946, and Mack Gordon, 1904 - 1959, songwriters
1943	Brown, Nacio Herb, 1896 - 1964, and Arthur Freed, 1894 - 1973, songwriters
1943	McHugh, Jimmy, 1894 - 1969, Dorothy Fields, 1905 - 1974, and Ned Washington, 1901 - 1976, songwriters
1942	Waller, Fats, 1904 - 1943, and Andy Razaf, 1895 - 1973, songwriters
1942	Rogers, Roy and the Sons of the Pioneers, 1933 - 1950, country music group
1942	Weill, Kurt, 1900 - 1950, Bertolt Brecht, 1898 - 1956, and Maxwell Anderson, 1888 - 1959, songwriters
1942	Rodgers, Richard, 1902 - 1979, Lorenz Hart, 1895 - 1943, and Oscar Hammerstein II, 1895 - 1960, songwriters
1941	Gay, Noel, 1898 - 1954, music hall and musical comedy songwriter
1941	MacMillan, Sir Ernest, 1893 - 1973, conductor and composer
1941	Memphis Minnie, 1897 - 1973, blues singer and guitarist
1941	Warren, Harry, 1893 - 1981, and Al Dubin, 1891 - 1945, songwriters
1940	Christian, Charlie, 1916 - 1942, jazz guitarist
1940	Delmore Brothers, The, 1916 - 1952, country singer-songwriter duo
1940	Broonzy, Big Bill, 1893 - 1958, blues singer and guitarist
1940	Stalling, Carl, 1888 - 1974, composer of cartoon music
1939	Donaldson, Walter, 1893 - 1947, and Gus Kahn, 1886 - 1941, songwriters
1939	Bliss, Sir Arthur, 1891 - 1975, composer
1939	Boulanger, Nadia, 1887 - 1979, educator, composer, and conductor
1939	Vallee, Rudy, 1901 - 1986, vaudeville and musical comedy singer
1938	Rainey, Ma, 1886 - 1939, blues and jazz singer
1938	Morton, Jelly Roll, 1890 - 1941, jazz composer and pianist
1938	Prokofiev, Sergey, 1891 - 1953, composer
1938	Whiteman, Paul, 1890 - 1967, jazz bandleader
1937	Johnson, Robert, 1911 - 1938, blues singer and guitarist
1937	Webern, Anton, 1883 - 1945, composer and conductor
1937	Handy, W. C., 1873 - 1958, blues composer band leader
1937	Porter, Cole, 1891 - 1964, songwriter
1936	Smith, Bessie, 1894 - 1937, blues and jazz singer
1936	Gershwin, George, 1898 - 1937, and Ira Gershwin, 1896 - 1983, songwriters
1936	Villa-Lobos, Heitor, 1887 - 1959, composer
1936	Lehmann, Lotte, 1888 - 1976, soprano
1935	Toch, Ernst, 1887 - 1964, composer and educator
1935	Stravinsky, Igor, 1882 - 1971, composer
1935	Chevalier, Maurice, 1888 - 1972, musical comedy singer
1935	Rubinstein, Artur, 1887 - 1982, pianist (not Anton, who died in 1894, alas)
1934	Carr, Leroy, 1905 - 1935, blues singer and pianist
1934	Oliver, King, 1885 - 1938, jazz cornetist and bandleader
1934	McCormack, John, 1884 - 1945, tenor
1934	Jolson, Al, 1886 - 1950, vaudeville singer
1933	Original Dixieland Jazz Band (ODJB), 1916 - 1937, jazz band
1933	Johnson, Tommy, 1896 - 1956, blues songwriter, singer, and guitarist
1933	Hay, George D., 1895 - 1968, founder of the Grand Ole Opry
1933	Blake, Eubie, 1883 - 1983, ragtime pianist and composer

1932	Rodgers, Jimmie, 1897 - 1933, country blues singer and songwriter
1932	Patton, Charley, 1887 - 1934, blues songwriter, singer, and guitarist
1932	Kern, Jerome, 1885 - 1945, songwriter
1931	Leadbelly, 1885 - 1949, blues singer and 12-string guitarist
1931	Johnson, James P., 1894 - 1955, jazz pianist and composer
1931	Grainger, Percy, 1882 - 1961, composer and pianist
1930	Macon, Uncle Dave, 1870 - 1952, country singer, songwriter, and banjoist
1930	Cantor, Eddie, 1892 - 1964, vaudeville singer and songwriter
1930	Stokowski, Leopold, 1882 - 1977, conductor
1929	Beiderbecke, Bix, 1903 - 1931, jazz cornetist
1929	Sachs, Curt, 1881 - 1959, and Erich von Hornbostel, 1877 - 1935, musicologists
1929	Kodaly, Zoltan, 1882 - 1967, composer and ethnomusicologist
1928	Smith, Pine Top, 1904 - 1929, blues and jazz pianist and singer
1928	Tucker, Sophie, 1884 - 1966, ragtime and vaudeville singer
1928	Ory, Kid, 1890 - 1973, jazz trombonist and bandleader
1927	Jefferson, Blind Lemon, 1897 - 1929, blues singer and guitarist
1927	Bartok, Bela, 1881 - 1945, composer, pianist, and ethnomusicologist
1927	Bloch, Ernest, 1880 - 1959, composer and educator
1926	Cohan, George M., 1878 - 1942, vaudeville songwriter and performer
1926	Lauder, Sir Harry, 1870 - 1950, music hall singer and composer
1926	Beecham, Sir Thomas, 1879 - 1961, conductor
1925	Peerless Quartet, 1904 - 1928, vaudeville vocal group
1925	Ziegfeld, Florenz, 1867 - 1932, producer of musical theatre
1925	Casals, Pablo, 1876 - 1973, cellist, conductor, and composer
1924	Murray, Billy, 1877 - 1954, vaudeville singer
1924	Kreisler, Fritz, 1875 - 1962, violinist and composer
1924	Friml, Rudolf, 1897 - 1972, operetta and musical comedy composer
1923	Ravel, Maurice, 1875 - 1937, composer
1923	Vaughan Williams, Ralph, 1872 - 1958, composer, educator, and conductor
1923	Lamb, Joseph F., 1877 - 1960, ragtime composer and pianist
1922	Harris, Charles K., 1865 - 1930, vaudeville and music hall songwriter and music publisher
1922	Von Tilzer, Harry, 1872 - 1946, vaudeville songwriter and music publisher
1922	Ives, Charles, 1874 - 1954, composer
1921	Macdonough, Harry, 1871-1931, vaudeville singer
1921	Lehar, Franz, 1870 - 1948, conductor and composer of operettas
1921	Schoenberg, Arnold, 1874 - 1951, composer
1920	American Quartet, 1909 - 1922, ragtime and vaudeville vocal group
1920	Scott, James, 1886 - 1938, ragtime composer and pianist
1920	Burr, Henry, 1882 - 1941, vaudeville singer
1919	Jackson, Tony, 1876 - 1921, jazz, ragtime, and blues pianist, songwriter, and singer
1919	Harney, Ben, 1871 - 1938, ragtime pianist, composer, and singer
1919	Rachmaninoff, Sergei, 1873 - 1943, composer, pianist, and conductor
1918	Europe, James Reese, 1881 - 1919, ragtime and jazz composer and bandleader
1918	Caruso, Enrico, 1873 - 1921, tenor
1918	Williams, Bert, 1875 - 1922, vaudeville singer and songwriter
1917	Ossman, Vess L., 1868 - 1923, ragtime banjoist
1917	Schenker, Heinrich, 1868 - 1935, music theorist
1917	Harlan, Byron, 1861 - 1936, vaudeville and ragtime singer
1916	Caryll, Ivan, 1861 - 1921, composer and conductor of musical comedies and operettas
1916	Nielsen, Carl, 1865 - 1931, composer
1916	Lomax, John Avery, 1867 - 1948, folk song collector
1915	Satie, Erik, 1866 - 1925, composer and pianist
1915	Collins, Arthur, 1864 - 1933, vaudeville and ragtime singer
1915	Toscanini, Arturo, 1867 - 1967, conductor

1914	Scriabin, Aleksandr, 1872 - 1915, composer and pianist
1914	Joplin, Scott, 1867 - 1917, ragtime composer and pianist
1914	Sibelius, Jean, 1865 -1957, composer
1913	Haydn Quartet, 1894 - 1914, barbershop style vocal group
1913	Stanford, Sir Charles Villiers, 1852 - 1924, composer and conductor
1913	Strauss, Richard, 1864 - 1949, composer and conductor
1912	Saint-Saens, Camille, 1835 - 1921, composer and organist
1912	Herbert, Victor, 1859 - 1924, cellist, conductor, and composer of operettas
1912	Delius, Frederick, 1862 - 1934, composer
1911	Debussy, Claude, 1862 - 1918, composer
1911	Puccini, Giacomo, 1858 - 1924, composer
1911	Janacek, Leos, 1854 - 1928, composer
1910	Berliner, Emile 1851 - 1929, inventor of disc recording and mass duplication
1910	Melba, Dame Nellie, 1861 - 1931, soprano
1909	Somervell, Sir Arthur, 1863 - 1937, composer and educator
1909	Paderewski, Ignacy Jan, 1860 - 1941, pianist and composer
1908	Mahler, Gustav, 1860 - 1911, composer and conductor
1908	Edison, Thomas Alva, 1847 - 1931, inventor of sound recording
1907	MacDowell, Edward 1860 - 1908, composer, pianist, and educator
1907	Lehmann, Lilli, 1848 - 1929, soprano
1906	Bolden, Buddy, 1877 - 1931, jazz and blues cornetist and bandleader
1906	Elgar, Sir Edward, 1857 - 1934, composer
1905	Bland, James A., 1854 - 1911, minstrel performer and songwriter
1905	Sousa, John Philip, 1854 - 1932, marching band composer and conductor
1904	Grieg, Edvard, 1843 - 1907, composer and conductor
1904	Humperdinck, Engelbert, 1854 - 1921, composer and educator
1903	Crosby, Fanny, 1820 - 1915, gospel hymn writer
1903	Bruch, Max, 1838 - 1920, composer
1902	Dvorak, Antonin, 1841 - 1904, composer
1902	Rimsky-Korsakov, Nikolai, 1844 - 1908, composer
1901	Wolf, Hugo, 1860 - 1903, composer
1901	Verdi, Giuseppe, 1813 - Jan 27, 1901, composer and vocalist in the guise of a Swedish moose

NOTES

Introduction

Intro.5: McCartney et al., 2000; Patel, 2003; Barash & Barash, 2005.

Chapter 1

1.1.1: Dissanayake, 1988, 2000; Pinker, 1997; Miller, 2000.
1.2.1: Slater, 2000; Zatorre, 2005.
1.2.2: Slater, 2000; Geissmann, 2000; Marler, 2000; Whaling, 2000; Tattersall, 2002.
1.2.3: Brown, 2000; Brown, Merker, & Wallin, 2000.
1.2.4: Merker, 2000; Geissmann, 2000; Falk, 2000; Brown, 2000; Peretz, 2001; Besson & Schon, 2003; Trehub, 2003.
1.3.1: "Not a single organ...": Pinker, 1997, p. 27.
Multiple intelligences: Gardner, 1983, 1985, 1999.
Fodor, 1983; Gazzaniga, 2002.
1.3.2: Wilson, 1978; Pinker, 2002.
1.3.3: "The word 'module'...": Pinker, 1997, pp. 30-31.
Pinker, 1994, 1997; Kennedy, 2002; Zalewski, 2002; Johnson, 2004; Stafford & Webb, 2005.
1.3.4: Myth of 10% use of the brain: Pinker, 1997; Stafford & Webb, 2005.
Pinker, 2002; Patel, 2003; Johnson, 2004.
1.3.5: Storr, 1992; Balaban, Anderson, & Wisniewski, 1998; Trehub, 2000, 2003; Dissanayake, 2000; Peretz, 2001; Huron, 2003; Zatorre, 2005; Mithen, 2005.
1.3.6: "Music can best be understood...": Storr, 1992, p. 64.
Zuckerkandl, 1973; Lerdahl & Jackendoff, 1983; Jackendoff, 1994; Whaling, 2000; Brown, 2000; Brust, 2003; Altenmuller, 2003; Peretz & Coltheart, 2003.
1.3.7: Why mom holds baby on the left: Ingram, 2003, pp. 32-44.
Wilson, 1978; Brown, Merker, & Wallin, 2000; Peretz, 2001; Levermann, 2003; Trainor & Schmidt, 2003; Baron-Cohen, 2003; Johnson, 2004; Stafford & Webb, 2005; Hotz, 2005; Sax, 2005.
1.3.8: Storr, 1992; Pantev et al., 1998; Balaban, Anderson, & Wisniewski, 1998; Brown, 2000; Falk, 2000; Molino, 2000; Peretz, 2001; Parsons, 2003; Zatorre, 2003b; Altenmuller, 2003; Patel, 2003; Sax, 2005.
1.3.9: "Some may say...": quoted in Evenson, 2003.
Jourdain, 1997; Ayotte, Peretz, & Hyde, 2002; Evenson, 2003; Peretz & Coltheart, 2003.
1.3.10: "The ability to acquire...": Chomsky, 1972, p. 102.
Stroop effect: Stroop, 1935; Johnson, 2004; Stafford & Webb, 2005.
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Chapter 5

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5.5.10: Bunt & Pavlicevic, 2001; Gabrielsson & Lindstrom, 2001.

Chapter 6

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Chapter 7

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Chapter 10

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Chapter 11

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Chapter 12

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INDEX

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M

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S

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